The Milbank Memorial Fund

QUARTERLY

CONTENTS

		Page
SICKNESS INSURANCE AND MEDICAL CARE	*Michael M. Davis*	287
A COST ANALYSIS OF CLEARING TUBERCULOSIS FAMILY CONTACTS	*H. R. Edwards, M.D. and Grace Unzicker, R.N.*	306
A PROJECT IN RURAL SCHOOL HEALTH EDUCATION	*Ruth E. Grout*	317
AN ORGANIZED COMMUNITY HEALTH EDUCATION PROGRAM	*Savel Zimand*	329
DIETS OF URBAN FAMILIES WITH LOW INCOMES	*Dorothy G. Wiehl*	343
PUBLIC HEALTH IN RURAL RECONSTRUCTION AT TING HSIEN	*C. C. Ch'en, M.D.*	370
PAMPHLETS FOR DISTRIBUTION		379

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SICKNESS INSURANCE AND MEDICAL CARE

by MICHAEL M. DAVIS[1]

IMMEMORIALLY the needs of the destitute and the sick have challenged humanity with the precept, "bear ye one another's burdens." The appeal which sickness makes is not quite the same as the call to succor the poor. For sickness is of its nature a calamity which strikes unforeseen, which anybody may have any year, and which almost everybody does have some year. It is one of the universal risks of life. If the costs of caring for sickness have to be paid as fees to doctors, hospitals, nurses, et cetera, at the time when sickness occurs, the costs fall directly and wholly upon the sick person or his family, who may find it difficult to meet them because they are often unexpected; and even when an illness can itself be foreseen, the amount of its costs can rarely be foretold and may vary from a few dollars to many hundred. Against this risk the experience of humankind has developed four methods of easing the burden, by distributing the blow among a group of people and over a period of time.

Oldest and most emotionalized is the method of charity. A, who loses his income on account of sickness and who must meet the costs of medical care, has his needs met out of the benevolence of B. B may be an individual, a church, or an organized charitable agency. If an institution or agency, B represents, however, the pooling of the contributions of individual charitable givers. If he is an individual he is not necessarily a wealthy philanthropist. A vast amount of charity is given to the sick poor by neighbors who have only a little more means than they. A very large amount is given by physicians themselves. "The poverty of a patient," says the

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Principles of Ethics of the American Medical Association, "should command the gratuitous service of a physician." The physician's gift of entirely free service to the needy is one of the important forms of personal benevolence. In any instance the process of charity represents, from the economic standpoint, a redistribution of the costs of sickness, a spreading of the burden from one part of a social group to another, and from the sick to the well.

The "sliding scale" involves the principle of distributing costs, but it is administered by the producers of medical service rather than by the consumers. The physician, the dentist, or the hospital may adjust charges in some relation to the means of the sick person. In so far as the producer can secure comparatively large fees for a given service from a certain number of well-to-do clients, he can the more readily afford to give his services free, or for nominal charges, to those who can pay nothing, or only a little. Obviously, only those physicians who reach the ten or fifteen per cent of the people who constitute the well-to-do and wealthy classes can practice the sliding scale to any considerable extent. The practice of a large proportion of physicians is, however, mainly or entirely among persons of moderate circumstances. Such physicians may and do give charity, but they can do little with the sliding scale principle except slide the scale down. This method has, moreover, the serious limitation that it distributes costs only among sick persons of different economic groups, not among both the sick and the well. The sliding scale is much more applicable to specialist care, surgical operations, and consultations than to the home or office visits of the general practitioner. The increased variety of medical services, due to specialization and other factors, has promoted the extension of the sliding scale, of which much has been heard in recent years.

How widely applicable are the principles of charity and of the sliding scale? The costs of medical care arising among the population with family incomes of less than $2,500 a year (about 80,000,000 people in our last period of prosperity) amount to approximately $2,000,000,000 a year. Any really effective plans for distributing the financial burdens of sickness must be able to deal with figures of this order of magnitude. The total volume of charitable gifts in the United States to organized agencies has probably never exceeded $100,000,000 in any year. Only a part of this is devoted to sickness. The total amount of medical charity given by physicians can be estimated from the studies of the Committee on the Costs of Medical Care as being, in normal times, somewhat less than one-tenth of the total income of all physicians in private practice. This comes to just about the same sum. Thus the distribution of medical costs through charity and the sliding scale, taken together, amounts to only about one-tenth of the $2,000,000,000 annually involved in the care of sickness among the mass of the population.

The third and fourth methods of distributing costs, taxation and insurance, are less personal and more capable of application on a large scale. Consider taxation. By authority of law, the government requires payment from individuals and organizations into a common fund, out of which various services are provided to the community as a whole or to certain individuals. It is important to distinguish two types of taxation. In the first place there is general taxation, usually of property or of income, levied generally with reference to the ability of the agency or individual to pay. The amount to be raised is fixed with reference to the gross governmental budget and not with reference to the value of the services which the individual taxpayer may receive. Another form of taxation is known in the terminology of public finance as

"special assessment." Here the tax is levied upon all the individuals or corporations which receive or may expect to receive certain services or advantages. The amount of the contribution may be equal for all or may be graded in proportion to the amount of benefit received, as in the case of a levy for street improvements. In either case, the tax (assessment) is paid only by those who secure, or are entitled to secure, certain benefits.

The principle of general taxation is now extensively used in this country in meeting certain costs of sickness, as for public health work, mental disease, hospital care, et cetera; but the assessment principle may also become very important, as we shall see. About $600,000,000 has been paid annually in recent years out of tax funds, local, state, or federal, to meet the expense of hospitals and public health work. This is in addition to expenditures for the material relief of families who can not support themselves when the wage-earner is sick. These $600,000,000 represent a redistribution of certain costs of sickness so that they do not fall upon the individual family at the time of illness, but are carried by the community as a whole, distributed in the main so as to fall upon those who have the ability to pay. If we compare this amount with the total annual sickness bill of the whole population, we see that taxation has assumed only a small fraction of it (less than 20 per cent).

The fourth method of distributing the uncertain and uneven burdens of sickness is insurance. The ENCYCLOPEDIA BRITANNICA defines the word, in a statement quoted in Rubinow's SOCIAL INSURANCE (page 3), as "A provision made by a group of persons, each singly in danger of some loss, the incidence of which can not be foreseen, such that when such loss shall occur to any of them it shall be distributed over the whole group."

What are the implications of this definition with respect to sickness? The extent to which the principle of insurance is applicable to sickness and the limitations of the principle in this application can only be determined after a statement of specifications. In the United States, in practice, insurance has as yet been applied to sickness only in slight degree as compared with Europe, while we have made relatively much larger use of taxation. The respective places of taxation and insurance as means of distributing the cost of sickness are likely to be of substantial practical interest in this country during the next few years. The vast extent to which insurance has been applied in the United States to the hazard of death leads us to think of life insurance as the essential or controlling type. It is important to appreciate that the elements which are involved in life insurance may not be the same as those which are significant in other forms. Let us set down, in the first place, four general specifications as to what is involved in the insurance principle:

1. Insurance can only exist when there is a hazard or contingency in which persons have a definite interest, so as to create a substantial reason for insuring against it.

2. The contingency must be capable of at least approximate expression in money terms.

3. The rate of occurrence of the contingency must be predictable for a group of persons within reasonable limits of accuracy.

4. It must not be possible for the contingency to happen to all or to too large a portion of the group at any one period.

A glance over this list indicates at once that the hazard of sickness falls within the scope of these requirements very much as do the hazards of death, fire, or old age. People have an obvious interest in the contingency of sickness and this interest can be approximately measured and at least roughly

expressed in financial terms. The rate of occurrence of sickness is predictable for groups of people within reasonable limits, on the basis of previous experience. While it is conceivable that in an epidemic sickness might occur to a very large proportion of a group at one time, this no longer happens to a serious degree in Western countries. Moreover, the major epidemics, except influenza, are communicable diseases for which public authorities have assumed responsibility. The cost of caring for these will be borne by taxation when necessary.

A decided contrast appears between life insurance and sickness insurance in a financial aspect. The financial basis of sickness insurance might be stated as follows: Payments from the individual members of the group must be accumulated in advance of the occurrence of the contingency against which the members of the group are insured; in order that, as the contingencies occur, payments can be made to cover the risks or to provide the services stated in the contracts, with a margin for working capital and for administrative expenses.

In sickness insurance the current payments into the insurance fund will each year about balance the current outlay of the fund in behalf of the beneficiaries, allowing, of course, for administrative expenses; and there need be only a small accumulation of working capital or reserve for emergencies, which should be currently available and carried over from year to year.

In life insurance, on the other hand, and similarly in old age or invalidity insurance, the insured person pays for a long period, in the typical case, before receiving any return, and the insurer must accumulate from the periodic payments made by or in behalf of the insured persons a fund which will be capitalized and invested. At any given time the in-

surance organization must hold a large fund consisting of this capitalized reserve. In sickness insurance, on the other hand, the annual intake and outgo nearly balance themselves year by year without requiring any substantial reserve. One might say that in sickness insurance we are dealing with currently disposable risks, whereas life insurance, old age pensions, or invalidity insurance must deal with capitalized risks.

One further contrast may be made. In life insurance the obligation of the insurance organization is discharged by the payment of money. In sickness insurance, as administered all over Europe, and in numerous, though relatively small experimental plans in the United States, a large proportion of the insurance fund is expended not in direct money payments to the beneficiaries, but in providing services, i.e., various forms of medical care. As was shown in a preceding paper, the costs of medical care now constitute a larger proportion of the economic burden of sickness than formerly, and are substantially greater than the wage losses due to sickness. Hence the provision of service in the form of medical care to the insured persons has become increasingly important as compared with direct money payments to them. The nature of medical service, involving as it does many complex elements and varying costs, introduces administrative factors into sickness insurance of much greater difficulty than exist in life insurance or old age pensions, where the administrative issues are the comparatively simple ones of money payments.

There are other elements in sickness which require more intimate study before their relations to the principle of insurance can be defined. For this purpose we must sub-divide sickness into three types.

GROUP I. *Acute illness.* The characteristic is that these dis-

eases run a definite course. The designation "self-limiting" may be applied with approximate correctness. Examples of this group are the common infectious diseases, many of the frequently recurring diseases of the respiratory tract—colds, bronchitis, and pneumonia—and a large number of the conditions demanding surgical operations.

GROUP II. *Chronic illness.* The characteristic feature of this group from the present point of view is not so much the duration of the illness as the absence of any defined course or term. A large part of the diseases and disorders of middle and late life, affecting the gastro-intestinal tract, circulatory system, metabolic, mental and nervous conditions, fall into this class.

GROUP III. *Preventable diseases.* Conditions preventable wholly or largely by known methods. Some of these methods have specific reference to particular diseases, e.g., the control of typhoid fever through water supply and other sanitation; the control of smallpox and diphtheria through specific immunization; of rickets through an adequate diet. A group of conditions causing infant mortality, and the important disease, tuberculosis, fall in part into this category, since while not strictly preventable, they can be largely reduced by known medical and educational methods.

Recognizing the limitations of this classification, it may nevertheless help to answer the question: How far is the principle of insurance applicable to sickness?

It is at once apparent that Group I meets the requirements much more fully than Group II. While the duration of economic disability, if any, and the amount of need for medical care will vary among individual cases in diseases of Group I, nevertheless the degree to which the risk is under the individual's control is much less as a rule than in Group II. In the latter, the duration and degree of disability and the amount and duration of medical care are much less easily

definable and much more affected by the patient's desires or temperament—i.e., by those factors which insurance people have been accustomed to describe as the "moral hazard."

Group III, the preventable diseases, are not, properly speaking, insurable risks at all. They are removable risks, not insurable ones. We ought not to have to insure against a risk if by known methods it can be prevented or largely reduced by or in behalf of the individual. Fire-insurance companies can write policies covering theaters or factory buildings which are fire-traps. But it is better public policy to require certain preventive measures (fire-proofing, etc.) to eliminate certain risks and to lessen others greatly. Irrespective of insurance rates, these requirements may be made to prevent burning people up.

During the lifetime of living men, there have been important changes in the relative size of these three sickness groups. Group II, chronic illness, has increased relatively to Group I. Group III, preventable disease, was insignificant sixty years ago. During the last thirty years it has been increasing in absolute and relative importance. Medical, social, and economic factors have combined to produce lower birth rates and death rates, and to give us a population with a substantially smaller proportion of children and young persons than was the case a generation ago. The diseases of Group II which are characteristic of middle life and old age are thus inevitably on the increase.

A rough estimate of the relative costs of Groups I, II, and III, leads to the conclusion that for the entire population the costs of medical care for Group I are somewhat over two billion dollars a year, the costs for Group II somewhat over one billion, while the costs of organized disease prevention are at present only about one-tenth of a billion. From the

economic standpoint, therefore, disease Group I is of major though not of overshadowing importance. With respect to Group III it is the opinion of the leading public health authorities that the effective annual expenditure should be at least two and a half times the present rate, or $250,000,000 a year instead of $100,000,000.

From the point of view of insurance, what issues are raised by these various types of sickness and their several characteristics? It is evident that some of the disease conditions, particularly in Group II, may occur more or less frequently or may be of longer or shorter duration, dependent upon the attitude of the individual patient. In life insurance the occurrence of suicide, in fire insurance the possibility of arson, would, if they happened frequently enough, vitiate the present type of insurance provision against these hazards. If to provide against a risk which the individual faces is of the essential nature of insurance, then from the standpoint of the individual a risk ceases to be a risk when it occurs by the deliberate action of the individual's will. The increased proportion of sickness now falling within Group II involves in psychological terms a larger proportion of sickness, the occurrence and duration of which are influenced by individual volition. The sickness insurance systems which in Europe involve many millions of people and which have been extending to more countries and more people for two generations have had to deal with this problem and the plans now developing in the United States will have to face it likewise.

Another closely related problem arises from the same cause. No administration of any plan of group action against contingencies such as death or sickness is practicable unless the actual occurrence of the contingency can be determined and unless the contingency can be defined or classified with reference to the terms of a pre-existent contract.

The occurrence of death is easily determinable; likewise the occurrence of acute or incapacitating illness. But the occurrence of some "minor" illnesses or the date of termination of some "major" illnesses may be quite difficult to define. The preceding classification again indicates that these difficulties are on the increase. From the standpoint of prevention, and of economy both in money and in human resources, it is important that many "minor" diseases be diagnosed and cared for since they may be the precursors or the early stages of very serious disease. Both the individual and the public have a greater interest than formerly that certain forms of medical service be rendered. To render such service, however, enhances the administrative difficulties of a sickness insurance scheme—difficulties which hardly existed when few illnesses were treated except those of the acute or incapacitating type.

The older European sickness insurance systems have had to face during the last twenty years: (1) Substantial extension of the period of disability due to sickness; (2) higher costs due partly to the prolongation of disability, and partly to more and more thorough medical care; and (3) increased difficulties in controlling the amount and costs of medical care. These difficulties are traceable to at least three factors. The first group of factors are fundamental trends in the science and art of medicine, alterations in the age distribution of the population and consequent changes in the relative prevalence of different types of disease. The second group of factors are the "moral hazards" usually denominated as malingering, sickness neuroses, et cetera, to which the changes just mentioned have given greater opportunity for displaying themselves. The third group of factors is the deliberate extension of the plans through which the costs of sickness are distributed. These deliberately made extensions include of-

fering benefits for a longer period of time, enlargement in the amount and variety of medical care provided, and the inclusion of much larger groups of the population by successive acts of legislation or, quite frequently, by the acts of insured groups themselves, who have voluntarily assessed themselves additional payments in order to provide larger benefits in time of need.

The systems in Europe have been extended despite these difficulties and despite increased costs, even during the general poverty of the post-war period. It would seem that these administrative difficulties and the higher costs have been more than balanced, in the minds of the European peoples and their legislators, by the fact that the *need* for distributing the costs of sickness among a group of people and over a period of time has increased during this same period. This increased need for distributing the costs of sickness has been due to the rising average level and the much greater range of these costs and doubtless also to an increased attention to the maintenance of health.

In dealing with these problems of administering services and of finances, existing systems of "sickness insurance" have developed policies and procedures, an analysis of which will be suggestive for future development. Under the procedures of insurance *per se*, an estimate of gross cost is made on the basis of previously recorded (actuarial) experience showing the incidence and expense of the risks concerned. If certain of these risks become less clearly definable and if the benefits to be provided involve an increasing provision of services rather than money payments, the determination of the "expense of the risks concerned" becomes more difficult; administration of the system likewise. A different procedure is therefore adopted. The wide variations in the amount and cost of desired medical care and the fact that

complete care would obviously cost more than many groups in the population are able or willing to pay, even on a regular periodic basis, leads to a procedure in which the actuarial experience of the past becomes a guide, but not a determinant. Under the new procedure the scope of service to be rendered is limited after consideration both of its content and of its cost so as to keep it within a probable maximum cost which it is believed in advance to be about what the people and agencies concerned will pay. This cost is then prorated among the beneficiaries and in part among other groups or organizations, such as employers or the state.

Such a procedure, involving the budgeting of services and of costs, is essentially the procedure of assessment. When the payments under such a scheme are made compulsory by law, this method of assessment is closely akin to the procedure of taxation. It differs chiefly in that the payments are required, at least in considerable amount, from the persons who are immediately benefited and in that the payments are usually prorated equally among all the persons of this group.

This procedure of assessment is part of a process through which "sickness insurance" systems in European countries are being gradually related more and more closely to systems supported by general taxation for providing certain forms of medical service to certain groups of the population. One example of this is preventive work. Certain types of disease (Group III) have ceased to be insurable in the technical sense of the term. But they have become budgetable either by individual persons or by a group of persons. It is found in practice that a body of people, through the agency of government or other agencies of group payment, will pay for preventive services for their members, whereas relatively few persons are as yet educated sufficiently concerning the

benefits of preventive work to budget individually for these services. Most preventive work, therefore, has been supported by taxation, with a certain tendency to take over a part of the cost into the "sickness insurance" systems (as in some tuberculosis activities abroad) and another significant tendency to relate the administration of medical service under the sickness insurance system more closely to the medical work administered through public health agencies. All this is in the direction of developing a coordinated system of medical services.

Another illustration is hospital care. Although acute illness requiring hospital service meets the theoretical requirements of insurance very well, the high relative costs of hospital work and the great initial capital investment in hospital buildings and equipment, long ago rendered it necessary in Europe that the provision of hospital care for most of the people be supported by group action rather than by fees of individuals. The hospital systems on the continent of Europe are preponderately maintained by taxes. Even in Great Britain this is true of the majority of the general hospital beds, and in the United States of about one-third of such beds. But even in the United States the capital for hospital buildings and equipment has been more than 90 per cent provided as "social capital," that is, by private gifts or tax grants rather than from the fees of individual patients. Along with the extension of sickness insurance in European countries, the hospital system has proceeded primarily as a tax-supported form of medical care. The two systems, however, have entered into relations in that (1) a portion of the cost of hospital care for insured persons is now generally paid by the insurance system, thus taking over a share of the costs from general taxation; (2) a certain though relatively small amount of hospital care has been financed wholly and ad-

ministered directly by local sickness insurance units themselves for their members.

A third illustration is the medical care of the lower economic groups of the population, the chronically unemployed and other indigents. In Western countries this has been provided for either by voluntary charity or by taxation, taxation being everywhere the major reliance. There is also a group of persons, normally larger in numbers, who, while usually employed, earn such low incomes that their periodic payments into an insurance scheme could not be sufficient to meet the costs of adequate medical care without taking so large an amount of their income that their general standard of living would be seriously lowered. Assessments levied upon employers in many countries, and in some countries also from the state, have been utilized as a means of raising the payments made by such persons to the sickness insurance fund enough to cover minimum benefits to this group of the population.

Thus the tax-supported systems of medical care and the systems of medical care supported by "sickness insurance" or by group assessment, have come into closer relationships. The increased emphasis on the provision of medical services has promoted the growth of these relationships and tended, though slowly, towards coordination of these two systems and in some countries in Eastern Europe almost to their administrative unification.

In the United States, what is here called the principle of assessment is likely to be much utilized in designing group payment plans for medical service. In this country most of the people except unemployed persons and others with very low or unstable incomes are now paying considerable sums for medical care each year. The uneven distribution of these payments among the individuals of the group each year con-

stitutes the real burden and is one of the major causes for the limited or inadequate service which many receive. Studies already made have shown that the amounts now expended for medical care by families with incomes of $1,200 a year and above, if pooled through some group payment, would furnish a larger and more accessible volume of medical care than is now usually secured. To assess upon any economic group of the population what on the average its families have been spending annually for medical care, and to use this fund in some organized way so that this group shall secure more and better care would seem reasonable. In a number of sickness insurance plans which have been in successful operation for some time in the United States, expenditures of the order of magnitude of $50 to $100 per family are made by the voluntary self-assessment of the people concerned. In designing more extensive plans, such practical questions as the following will arise: How much medical care can be furnished a family in a given part of the country for say $75 a year? Or, under other conditions, for $60 a year? Or for $100 a year? Such questions lead at once to the consideration of the adequacy of medical service, and of the most important types of medical care. How complete and adequate would be the service? How much general medical service, specialist care, hospital care, dentistry, nursing service, provision of drugs and medicines, ought to be included within a given scheme? How much can be included for a given amount per year? What types should be given priority so that they should be included within the scope of service limited by a restricted financial assessment? What supplementation of payments by employers and for the state must be required in behalf of low-income groups in order that at least a necessary minimum of service shall be provided?

In considering such questions, it must not be thought that

medical care can be measured like yards of cloth, or can be expressed wholly in financial terms. Nor is a poor *quality* of service worth having at all. But there are relations between the scope and kinds of medical service and the price paid for it, and these must be considered, from professional, human, and financial standpoints all together.

At this point, however, the questions of adequacy become involved in the question of the relative economy of medical service when supplied under different methods of organization. What would be the relative costs, for example, of furnishing specialist service, surgical operations, and other relatively expensive forms of personal medical attention under a system requiring payment of fees to individual practitioners as compared with the cost under a system of group practice, utilizing clinics with physicians remunerated either on a fee or a salary basis? How great are the economies of organization? How much of the 40 per cent overhead of the individual private practitioner's office can thus be saved? How much can be saved in the expenses of ancillary tests, appliances, and medicines? How important are the possible disadvantages of clinic organization, the supposed diminution of personal relationships, et cetera?

These financial and professional considerations must all be weighed. They will affect certain forms of medical service much more than others and in different directions. Undoubtedly the divergencies between the costs of service under different methods of furnishing the service are substantial. Foreign as well as American experience indicates that the differences are of the order of 25 to 40 per cent rather than of the order of 10 per cent, and are thus of extreme practical importance in designing and administering programs of medical service for large groups of people.

In summary, the general principle of distributing the costs

of medical care has been effectuated by several methods, of which the most important are taxation, insurance, and the intermediate principle of assessment. Recent trends in the science and art of medicine, in the characteristics of disease, in the constitution of the population and in the costs of medical care have created an increased need for distributing the costs of care, and at the same time greater difficulty in the administration of plans for effecting this distribution. In the United States there has been an increasing use of the principle of taxation. The principle of assessment has been utilized in experimental plans under the name of insurance in the United States to distribute the costs of care for some local groups of people, and has been developed extensively in Europe under the aegis of compulsory sickness insurance systems. The principle of assessment retains the element of direct financial responsibility on the part of the individual beneficiaries, and may be adjusted with flexibility in application to different scopes of service and differing capacities to pay. It is also adapted to non-governmental administration of medical care, such as predominates in all Western countries except Russia.

With the advancing complexity and cost of medical service, the methods through which preventive and curative services are organized and furnished come into the foreground for two reasons. First, because the cost of furnishing service is substantially affected by the method through which care is furnished; and second, because the supply of adequate service and the maintenance of high professional standards are involved in the same problems of organization and administration. Two subjects require continued study in order that there shall be scientific information available for the guidance of the professional and financing groups concerned with these matters. In the first place, competency and adequacy of

service must be defined and made capable of appraisal, through scientific studies from the professional standpoint. In the second place, these professional studies must be paralleled by studies of the economical provision of service; what are the costs of adequate medical care, and what differences exist between the costs of furnishing adequate care under various methods of organization of service? There is little doubt that in the United States important voluntary groups and some state legislatures will, during the next few years, carry through experiments in organized group payment which are likely to have far-reaching results. The time for academic study has passed into a period when there is demand and need for action; but action should be in the mood of experiment and be guided by critical appraisal and research.

A COST ANALYSIS OF CLEARING TUBERCULOSIS FAMILY CONTACTS

by H. R. EDWARDS, M.D.[1] AND GRACE UNZICKER, R.N.[2]

TUBERCULOSIS case-finding is considered at the present time to be one of the most logical measures for the control of the disease. It involves not only finding the case, but the problem of examining all members of the family in contact to that case. Further, it is generally conceded that a similar clearing of family contacts should be undertaken in all those families in which a child is found to have a positive reaction to tuberculin. Theoretically this may be a desirable procedure, but practically some serious questions may be raised as to its value. In other words, from an administrative angle it would be worth while to know the cost involved in visiting nurse and dispensary or clinic service to secure reasonable examination of all family contacts.

There is considerable data available on the frequency of finding infection and new disease among family contacts to known open pulmonary tuberculosis. Also experience suggests that a positive tuberculin in a preschool child is much more likely to lead to undiagnosed cases in the family or close contacts than is the case with a positive tuberculin in the teen age. (1), (2), (3), (4), (5), (6), (7).

If in our widespread tuberculin testing programs in the schools we can, with reasonable safety, feel that exhaustive studies of family contacts are productive of only an occasional case, we can at once free a considerable amount of service and funds to apply to more productive fields.

In order to get some concrete idea of this problem, it is necessary to make cost analyses of a number of families in

[1]Acting Health Officer, New Haven Department of Health.
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which all members have been examined and diagnosed under comparable conditions. The cost involved would be estimated on the nursing visits required to get the individuals into the clinic to the point of a definite diagnosis, and the dispensary service in visits and X-rays required to make that diagnosis.

The data to be presented from New Haven is drawn from existing material that has been, and, for the most part, still is considered a responsibility of both the New Haven Visiting Nurse Association and the New Haven Dispensary.

New Haven has a population of 162,692 as of July 1, 1933. On April 1, 1934, there were 1,589 diagnosed cases of tuberculosis (all forms) on the roster of the Bureau of Tuberculosis. Approximately 250 were known to have some degree of clinical activity, the remainder were supposedly inactive. The diagnoses go as far back as 1915, but the majority were made within the past five to ten years.

It is estimated that there are in New Haven (April, 1934) about 1,503 families in which there is a tuberculosis problem falling in one of the following categories:

1. Families with a diagnosed case of tuberculosis, (all forms) now living, and in an active, quiescent, or arrested stage.
2. Families in which a member has died of tuberculous disease, including all such in the past three years, and many preceding 1930 which are now on our records.
3. Families which have been exposed to some known extrafamilial case of tuberculosis.
4. Families in which a member, usually a child, has been found positive to tuberculin.

Twelve hundred of these families have been known to the Visiting Nurse Association at some time, the majority still being under active care. This group likewise has been known

to the New Haven Dispensary. At present we have complete family charts for this group, which show for each member of the family, name, age, all available data on previous examinations, tuberculin tests, X-rays, diagnoses, and hospitalization.

RESULTS OF "CLEARING" CONTACTS

The analyses to follow are taken from the group of families under the Visiting Nurse Association and dispensary care in which we have a reliable diagnosis of every member. There is a total of 213 such families which may be grouped according to the first manifestation of tuberculosis in the family:

I. Those in which the first known source of infection was a pulmonary case. The case may have been a member of the family, or at least, a known intimate contact.

II. Those in which the first indication of tuberculosis was manifested by a positive tuberculin in a child.

III. Those in which the first indication of tuberculous disease was a death from tuberculous meningitis.

The major distribution of these families, and the individuals comprised are shown in Table 1.

Table 1. Number of contacts examined in families presenting a tuberculosis problem.

Classification of Families	Number of Families	Total Contacts	Age and Sex					
			Adults[1]			Children[2]		
			Total	Male	Female	Total	Male	Female
ALL GROUPS	213	964	346	137	209	618	317	301
Group I	162	673	226	85	141	447	231	216
Group II	42	241	99	42	57	142	71	71
Group III	9	50	21	10	11	29	15	14

[1]Individuals 16 years or over at time of first diagnosis in family.
[2]Individuals under 16 years at time of first diagnosis in family.

Diagnoses	Per Cent			Number		
	Total	Adults	Children	Total	Adults	Children
TOTAL EXAM. AND DIAG.	100.0	100.0	100.1	673	226	447
Pulmonary tuberculosis	8.8	15.5	5.4	59	35	24
Childhood type tbc.	14.9	4.0	20.4	100	9	91
Glandular tuberculosis	3.1	.9	4.3	21	2	19
Bone	.1	..	.2	1	..	1
Others	2.7	.9	3.6	18	2	16
No manifest tbc.	42.3	21.2	53.0	285	48	237
Non-tuberculous	28.1	57.5	13.2	189	130	59

Table 2. Diagnoses made in the examination of 673 contacts in 162 families in which the primary case was pulmonary tuberculosis.

I. *Families in Which the Primary Case Was Pulmonary Tuberculosis.* The examination of all contacts in this group (Table 2) has resulted in 199 new diagnoses of tuberculous disease, 59 of which were pulmonary disease, and 14, or 23.7 per cent, had bacilli in their sputa. Five of the pulmonary cases were considered negative for tuberculosis at the first examination, but were diagnosed during the follow-up since that time.[3]

In 40 of the 673 individuals examined, there is record of a change in diagnosis during subsequent examination. Five were changed from a non-tuberculous diagnosis to a pulmonary tuberculosis, three of which had a positive sputum.

The incidence of positive sputa among primary cases is shown in Table 3. It is clear that in 103 of the 162 families

[3]The dispensary procedure has varied considerably during the period in which the individuals in these families were cleared. Previous to 1925 it was customary to make many diagnoses on physical examination alone, whereas since then the X-ray has been utilized more frequently, and in the past two years the fluroscope is almost routine, regardless of physical findings. Thus it is conceivable that many of the diagnoses of "non-tuberculous" made previous to 1925 might today be changed to a childhood type on X-ray study. It is fairly certain that a few diagnosed as "non-tuberculous" or "no manifest" before 1925, excepting five, were not adult pulmonary cases because more recent information on the cases indicates they are in apparent good health.

Individuals	Total No. Families	Sputum Positive	Diagnosis at Death	Pos. Sputum and Diag. at Death	Per Cent Infectious
TOTAL	162	103	29	132	81.5
Father	92	59	17	76	82.6
Mother	51	34	7	41	80.4
Child	10	4	2	6	60.0
Other intimate contacts	9	6	3	9	100.0

Table 3. The incidence of positive sputa in the primary cases in the families of Group I, and the cases diagnosed at the time of death.

one or more positive sputa were obtained. In 29 other families the primary case was diagnosed first at the time of death, and in all probability the majority had positive sputa. Thus it is reasonable to state that 132 (81.5 per cent) of the primary cases were known to be infectious.

II. *Families in Which the Primary Case Was a Child Positive to Tuberculin.* In this group of families the primary child showing a positive tuberculin was discovered in routine clinic practice and was not previously known to have been in contact to a case of tuberculosis.

The examination of 241 contacts in this group (Table 4) revealed 42 new diagnoses of tuberculous disease, two of

Table 4. Diagnoses made in the examination of 241 contacts in 42 families in which a positive tuberculin in a member was the first evidence of tuberculous infection.

Diagnoses	Per Cent			Number		
	Total	Adults	Children	Total	Adults	Children
TOTAL EXAM. AND DIAG.	100.0	99.9	100.0	241	99	142
Pulmonary tuberculosis	0.8	1.0	0.7	2	1	1
Childhood type tbc.	8.7	1.0	14.1	21	1	20
Glandular	6.2	2.0	9.2	15	2	13
Others	1.7	3.0	0.7	4	3	1
No manifest tbc.	43.6	24.2	57.0	105	24	81
Non-tuberculous	39.0	68.7	18.3	94	68	26

Diagnoses	Per Cent			Number		
	Total	Adults	Children	Total	Adults	Children
TOTAL EXAM. AND DIAG.	100.0	100.1	99.9	50	21	29
Pulmonary tuberculosis	20.0	38.1	6.9	10	8	2
Childhood type tbc.	18.0	4.8	27.6	9	1	8
Bone	2.0	0	3.4	1	0	1
No manifest tbc.	40.0	14.3	58.6	20	3	17
Non-tuberculous	20.0	42.0	3.4	10	9	1

Table 5. Diagnoses made in examination of 50 contacts in 9 families in which the primary case was tuberculous meningitis.

which were classified as pulmonary disease. One adult had bacilli in his sputa and the child so diagnosed had an apparently healed lesion. Only 17.4 per cent of the contacts in this group was found to have some manifest form of tuberculosis, compared to 29 per cent in Group I.

III. *Families in Which the Primary Case Was Tuberculous Meningitis.* Tuberculous meningitis constitutes only about 4 per cent of tuberculosis deaths. It is most frequent in infants and preschool children, but its importance as a lead to significant tuberculosis is clearly indicated in Table 5. Forty per cent of all contacts showed evidence of tuberculous disease, half of which were pulmonary. It is most likely that the infection of the primary case in this group occurred within the family, as in eight of the nine families the primary case was in an infant, and 7 of the 10 pulmonary cases found among contacts were known to have positive sputa.

ESTIMATING THE COST IN EXAMINATION OF CONTACTS

The cost of clearing a family has been based on two factors offering a reasonable basis of cost accounting: (1) Visiting Nurse Association visits and (2) dispensary visits.[4]

[4]Visiting Nurse Association visits are based upon the number of visits made in order to get the contact into the clinic to the point that a reasonably definite diagnosis could be made.

(Continued on page 313)

Table 6.

THE COST OF CLEARING 964 CONTACTS IN 213 FAMILIES CLASSIFIED ACCORDING TO TYPE OF PRIMARY CASE IN FAMILY

Age Groups	Number of Contacts	V. N. A.		Dispensary		X-Rays		Total	Unit Costs		
		Number of Visits	Cost $1.00 Per Visit	Number of Visits	Cost $1.00 Per Visit	Number X-Rayed	Cost $3.00 Per X-Ray	Costs	Contacts	New Diagnosis Tuber-culosis	New Diagnosis Pul. Tbc.
TOTAL FOR 213 FAMILIES											
All Ages	964	7,367	$7,367.00	2,306	$2,306.00	508	$1,524.00	$11,197.00	$11.62	$42.90	$157.70
Less than 16 years	618	6,336	6,336.00	1,773	1,773.00	392	1,176.00	9,285.00	15.02	47.13	343.89
16 years and over	346	1,031	1,031.00	533	533.00	116	348.00	1,912.00	5.53	29.88	43.45
I—162 FAMILIES—PRIMARY CASE—PULMONARY TUBERCULOSIS											
All Ages	673	5,613	$5,613.00	1,627	$1,627.00	350	$1,050.00	$8,290.00	$12.32	$41.66	$140.51
Less than 16 years	447	4,921	4,921.00	1,252	1,252.00	274	822.00	6,995.00	15.65	46.32	291.45
16 years and over	226	692	692.00	375	375.00	76	228.00	1,295.00	5.73	26.98	37.00
II—42 FAMILIES—PRIMARY CASE—A CHILD POSITIVE TO TUBERCULIN											
All Ages	241	1,102	$1,102.00	593	$593.00	144	$432.00	$2,127.00	$8.80	$50.64	$1,063.50
Less than 16 years	142	807	807.00	451	451.00	106	318.00	1,576.00	11.09	45.02	1,576.00
16 years and over	99	295	295.00	142	142.00	38	114.00	551.00	5.56	78.71	551.00
III—9 FAMILIES—PRIMARY CASE—TUBERCULOUS MENINGITIS											
All Ages	50	652	$652.00	86	$86.00	14	$42.00	$780.00	$15.60	$39.00	$78.00
Less than 16 years	29	608	608.00	70	70.00	12	36.00	714.00	24.62	64.90	357.00
16 years and over	21	44	44.00	16	16.00	2	6.00	66.00	3.14	7.33	8.25

The Visiting Nurse Association quotes $1.00 as the average cost of a tuberculosis visit. Visits were counted as nearly as possible by the tuberculosis supervisor to indicate only those visits in which the nurse endeavored to encourage clinic attendance.

The New Haven Dispensary until 1933 has not attempted cost accounting for the various special services. A fair estimate can be reached by using the known salary items and supplies. This averages about $1.00 per visit. X-ray charges are an additional item of cost, and are estimated at $3.00 per case. In the majority of instances children received a series of X-rays, consisting of stereo of chest, and postero-anterior view of neck and abdomen. The cost of fluoroscopic examinations has not been estimated in dispensary costs.

The cost of clearing contacts in the 213 families in Groups I, II, III is shown in Table 6. The unit cost of contact examination and the discovery of tuberculous disease with one exception is decidedly lower among those individuals 16 years and over. The exception occurs in Group II families. It is common experience to encounter more difficulty in securing cooperation from adults than children, and this difficulty is increased where the only incentive for routine examination is a child with a positive tuberculin. The discovery of new pulmonary tuberculosis in all groups is strikingly lower in those 16 years and older than among the children.

DISCUSSION

It is immediately obvious that in those families in which we find a case of tuberculous meningitis we are most likely

(Continued from page 311)

Dispensary visits are based upon the number of visits made to the dispensary by the contact before a definite diagnosis was made. The diagnosis may be "no manifest disease," but if in the course of time it is changed to "pulmonary tuberculosis" or some other form, the first diagnosis is the one used in this study.

to find the highest percentage of undiscovered significant tuberculosis. Tuberculous meningitis comprises only a small fraction of our tuberculosis deaths, but those families warrant prompt attention. In this study three of the ten pulmonary cases discovered died of tuberculosis subsequent to the discovery of the original case.

Families in which we find a case of pulmonary tuberculosis are also valuable sources of undiscovered pulmonary tuberculosis among contacts. The experience at Gaylord Farm as reported by Haywood *et al* (6) is almost a duplicate of the New Haven experience. Even though the cost of clearance is twice that of tuberculous meningitis families, it is unquestionably worth while, particularly in those families in which a member has a positive sputum.

The routine examination of family contacts to children with positive tuberculins in this study proved to be unreasonably expensive. The one case of significant tuberculosis, in all probability, would have been discovered along routine channels because the sputum was positive and the individual had clinical symptoms. It is interesting to note, however, that about 24 per cent of the children in this group had evidence of some form of manifest tuberculosis, chiefly the primary infection type. Thus the importance of casual infection is emphasized.

The study of this group, then, confirms the question originally raised: Is it administratively sound to spend the time and effort necessary to clear such families? The answer seems to be in the negative, unless we can place more significance on the discovery of primary type lesions.

Recently in New Haven we analyzed 155 cases originally diagnosed as childhood type tuberculosis. It was found that only 9, or 5.8 per cent, later developed an adult form of pulmonary tuberculosis. It was significant that in the 9 families

in which these cases were found there had been one or more cases (primary) diagnosed as pulmonary tuberculosis, and one as tuberculous meningitis. There were 12 pulmonary cases and one meningitis case known before the childhood type case was discovered, and 9 of the 12 pulmonary cases were known to have positive sputa.

Our experience then indicates that we can expect to find a very limited amount of significant tuberculosis in the routine examination of contacts to positive tuberculin reactors. In view of the excessive cost involved which is perhaps somewhat understated, our efforts can be placed elsewhere to better advantage.

SUMMARY

A cost analysis was made of 213 families in New Haven in which all members had been examined one or more times, and in which the visiting nurses had made visits to secure these examinations.

The families are divided into three groups: I. Primary case, pulmonary tuberculosis, (162); II. Primary case, a child with a positive tuberculin, (42); and III. Primary case, tuberculous meningitis, (9).

Pulmonary tuberculosis of the adult type was considered to be the significant finding in each group. The cost for each diagnosed case, including nursing visits, dispensary service and X-rays, according to family groups was as follows: I. $140.51; II. $1,063.50; III. $78.00.

From the standpoint of the dollar invested there is justification for the routine clearing of Group III families, and Group I families, particularly those with a positive sputum case. Group II families in our experience do not warrant such intensive study.

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A PROJECT IN RURAL SCHOOL HEALTH EDUCATION

by RUTH E. GROUT

III. BUILDING THE PROGRAM—UNIT TEACHING[1]

TWO groups of chickens are feeding in a corner of the schoolroom. The children are gathered around large cartons which serve as exercise pens and brooders combined. One little boy, a habitual coffee drinker remarks, "Why the milk chickens are larger than the others," and the teacher anticipates the experiment is proving its worth. Three weeks have passed since this chick-feeding experiment was started. During this time the children have participated in the feeding and care of the chicks. The six chicks in Box 1 have been fed a standard ration including milk and cod-liver oil. The diet of those in Box 2 has been the same except that water was substituted for milk. Differences between the two groups have been in evidence for some time. The milkfed chicks are more active, their bodies sturdier, and their feathers more fully developed than the others. As a group these better nourished chickens weight 13 per cent more than their brothers.

On a bulletin board over the chicks is a growth chart containing the monthly weight records of each child in the school. It is near the end of the year and the total gains for the year are recorded. For the past few weeks the children have been engaged in a study of growth of chicks and children and the factors which promote growth. Farm bulletins have been consulted to learn how to care for the chicks and

[1]From the Cattaraugus Supervisory School Hygiene District and the Division of Public Health Activities, Milbank Memorial Fund. This is the third of a series of papers by the director of the health education study in Cattaraugus County.

to become familiar with the food value of the chicks' rations. Health books and pamphlets have served as references for child growth. Such interest has been aroused in the whole experiment that even parents have visited the school and volunteered suggestions as well as asked many questions.

A phase of the rural school health education program in Cattaraugus County, New York, has been to experiment with health teaching through various types of purposeful learning experiences, or "units of work" such as that just described. Effort has been made to develop these units from the rural point of view and to integrate them with the daily life and needs of the country child both at school and at home.

Units of work differ as widely in extent and content as do gardens planted to vegetables. Plots of land, small or large, may be planted with single kinds of seeds or with combinations of seeds. In some gardens, where two or more kinds are mixed, one kind may predominate over the others. A fence, or less distinct line of demarcation, usually separates a plot from other parts of the farm. So with units of work as they are being considered in Cattaraugus County. Some units are short and principally limited to a single theme. Others are longer yet again centered around a single theme. The broader the unit becomes, however, the more varied are the experiences and activities related to it and the less distinct are the lines between the unit and the school activities as a whole. In a garden potatoes, carrots, and corn remain forever distinct. In a broad unit, there is a tendency to blend or integrate activities so that the child's learnings in various subject matter fields become integrated or fused into a unity of ideas. To illustrate, a unit of work on sleep may be limited almost entirely to a consideration from the health standpoint of sleep in general and the sleep habits of the children in the school and may last from one to several days. This unit may

be expanded to include wider interests, such as the relation of ventilation to sleep (science), the sleep habits of animals (nature study) and of children of other lands and times (social studies) yet the principal emphasis still is on the health problems of sleep. In contrast, the health aspects of sleep may be quite incidental to the center of interest in a broad learning situation. This was the case in a school where, as a part of a study of "time" each child wrote a diary of his day mentioning in it his rising and retiring hours.

Units of work also vary in quality. The success of a crop depends upon the farmer's knowledge of such things as soils, fertilizers, and climatic conditions as well as his skill in applying the knowledge. So also the success of a unit of work, in terms of child growth, depends upon the teacher's knowledge of such things as the psychology of learning, the principles of child development, the basic subject matter related to the unit as well as her skill in applying this knowledge.

Educators recognize four stages in any learning experience of an individual, namely, purposing, planning, executing, and evaluating, and believe that these steps should be discernible in good units of work. They also agree in general on certain criterions for evaluating units or larger activities on each level of children's development. A suggestive set of criterions has been prepared by teachers of New York State as follows:

1. Is the unit of work selected from a *real life situation* within the understanding of the pupils? Does it follow naturally the previous experiences of the children?
2. Does the unit afford many opportunities for *real purposing* and *planning?* Could the child carry it into his normal living situations?
3. Does the unit of work call out many kinds of activities and so provide for *individual differences?*
4. Does the unit permit *all-round growth* of each individual?

5. Does the unit of work furnish opportunities for *many kinds of endeavor,* furnish leads into other units and stimulate in the child the desire for a continued *widening of his interests and understandings?*
6. Will the unit give the child a better *understanding* of the demands of *society* and a better understanding of his *social environment?*
7. Does the unit provide for growth in the use of such *tool subjects* as contribute to the unit?
8. Does it lead to the development of *desirable habits?*

Units of work with health significance have been growing out of the rural school experiences in Cattaraugus County during the past three years. A few of these will be described in the following paragraphs and evaluated in terms of the above criterions.

In a small one-teacher school, where the teacher thought that posture was a problem, a simple but effective unit of work was carried out in an attempt to improve the condition. The unit was motivated by a visit to the school of "Peter Posture" a versatile posture doll. The teacher reports, "Immediately the children wanted to do something about their own posture. The first thing they did was to stage a 'moving picture show,' in which each child walked slowly and naturally across the front of the room. The class discussed how each one could correct his walking posture and why it was important to do so. Health books were used for reference in this. Two children collected pictures of people standing and sitting. Stick figures were drawn and clay models were made of good and poor posture in various positions.

"Some girls were wearing high-heeled shoes so we had an exhibition of shoes. We decided that shoes play an important part in posture. Now most of the girls are wearing lower heels. The foot with and without shoes was traced to see if our shoes were large enough.

"Exercises that would help posture were made up by the children. Tracks were made in the snow to see if we were walking correctly. Near the end of the day some children were apt to slump in their seats. I have found that marching to the tune of the victrola rests them."

The activities just described were based on real life situations and led to a development of desirable habits. Since the theme was a rather limited one, opportunity for many kinds of endeavor was meagre. Creative expression, which contributes to the well-rounded growth of a child, was given free play throughout the unit, however.

When the fall medical examinations were completed in another one-teacher school the findings were discussed informally and the conclusion was reached that something should be done to improve the condition of the pupil's teeth. The teacher had several aims in view as she encouraged a further study in this direction, such as better realization of the importance of giving the first teeth good care, of correcting teeth defects in general, and of eating proper foods for sound teeth. The children's questions which were formulated at the beginning of the study centered around ways of building strong teeth and keeping them in good condition. It was decided to summarize the findings of the study in booklet form and to make an effort to obtain corrections.

All of the children from beginners through the eighth grade took part in the study. They tied it in with their living by keeping a daily record for a time of the consumption of teeth-building foods. They linked it with their other school activities in various ways. Letters were written to the nurse, inviting her to speak to the mothers on the care of teeth. Other letters, requesting literature were sent out by the pupils. A study of animal teeth was made and incorporated in the booklet.

The interest aroused by this study has resulted in a community effort to raise funds for corrections. It has produced other equally tangible results. After the nurse's talk to the mothers, one family began to buy more milk for its children. Another family eliminated coffee from the children's diet and substituted more milk instead. One girl learned to like oatmeal after her mother's assistance had been enlisted and two older girls, who expect to leave school, say they plan to direct the first money they earn into teeth corrections.

In this unit the activities were so closely related to the life of each child that interest in them was maintained throughout the school year. The learning experiences were quite within the range of accomplishment at the various age levels although some of the ultimate goals were beyond the control of the children. This was realized by the teacher since she sought the help of parents and nurse in matters of diet and corrections. It is evident that the unit has led to a broader understanding of nutrition and good bodily health and to a cooperative community effort to improve an existing evil.

The farm served as a focus of interest in problems of sanitation and health in another one-teacher school. When the teacher was asked how the unit developed she remarked, "It just grew—it is hard to say how. It began when the suggestion was made that we construct a room to show proper ventilation. The children asked if they couldn't build a complete farm instead. This we did and as the plans developed various health principles were brought out."

One committee of children decided on the health problems to be stressed, another helped to furnish the house and plan for the "Happy Family" who live there while another committee constructed the house and farm. The children wrote imaginary stories about Mr. and Mrs. Happy and the Baby, in which they told how the family happened to move from

the city to the farm, and of the advantages brought about by the change. New words were learned by the younger children. Various problems in arithmetic arose as the construction work progressed. Color schemes and artistic arrangement of furniture were considered.

As various health questions arose reference books, including health books were consulted. To illustrate, the question "Where are we going to get the water for our farm?" was brought up by one child at the time a well was being drilled in the neighborhood. The matter was discussed informally and the children looked up all they could find in health books. The well was then constructed according to the best principles discovered. It was placed in a safe position relative to possible sources of pollution including the outside toilet they had built. As this work progressed the children talked about the water supplies at home and in the community.

The problems considered can best be described by quoting some of the signs prepared by the children for placing as labels on the farm. They were:

1. This family raises its own supply of vegetables so it will have fresh ones for summer and plenty left over for a winter supply. (Near garden.)
2. The baby sleeps in the air and sunshine. The net prevents germ-carrying insects from entering. (Near baby carriage.)
3. Windows and doors are screened to prevent flies and other insects from entering the house. (Near screened window.)
4. All garbage which cannot be burned should be buried. (Near incinerator.)
5. This family keeps two cows for its daily supply of fresh milk, butter, and cream. (Near barn.)
6. This well is properly located and constructed. It is at a safe distance from all refuse and is sealed. (Near well.)

The children worked on this unit for about two months, using the two hours each week ordinarily devoted to art, nature study, and hygiene. Activities in these three fields, as well as in others were included in the unit. Life situations close to the rural child formed the centers of interest but new and unexplored angles to these situations were introduced. The opportunities for group participation in many kinds of endeavor were numerous and the enthusiasm of the children was keen.

A long and inclusive unit of work called "Our School" was developed in still another one-teacher school during the year. The teacher reports concerning it:

> "During the summer vacation of 1933 the school district had made several improvements in the school building and grounds. The children had been at the school while the men were working and had made and painted several small things as clock shelf, waste paper basket, and chair. They were anxious to have school reopen in the fall because of the newness of it all. The first day of school, most of the conversation centered on the improvements so, this being the children's interest at the time, it developed into a unit of work on 'Our School.'
>
> "The unit occupied the entire school year. The whole school met as a group four times a week for a period of twenty to thirty minutes. The period was used for making plans, construction work, bringing in results of research, or whatever the need was at the time. The work of the first semester was centered around the schoolroom and a miniature schoolroom like our own was constructed. During the second semester emphasis was placed on the school grounds and a replica of the school grounds with desired equipment was built on the sand table.
>
> "The improvements already made were studied in groups. For example, under 'Safety' the value of the eaves to prevent ice from getting on walk, of stove jacket, et cetera, were discussed. These discussions led to a desire for still

further changes. In time the following improvements in the schoolroom were brought about by the children: making and furnishing a first aid kit; making pads for drinking cups; buying two ventilators for school, and making aprons to wear while painting.

"The first aid kit was an outcome of the study on safety. In making plans the children considered what materials were needed, how to fix them, and how to use the kit. We used health books as reference material and made a list of the contents needed. The children wanted to bring the things themselves. A cigar box was used for the case. Shelves were put in, a latch was added and the box was painted. As the children learned how to use the kit, demonstrations were carried out whenever possible. At the same time they learned how to use the fire extinguisher.

"The most important results of the study of school grounds were: learning new games; group entertainment once a month; making bird houses; making windmill for school grounds; making flower bed. In this study we included exercise, shoes, posture, and sports."

Throughout the year this unit was closely integrated with many school activities. Committees to do certain things were selected during the meetings of the School Club. The social studies activities which centered around the home and school fitted in very nicely with this unit. As a result the children were more courteous and careful with their school duties.

In nature study, the home, habits, and cleanliness of common wild animals were studied during the winter months and the home and habits of birds during the spring.

Arithmetic was applied in measuring and constructing the schoolroom and school grounds to scale. Drawing and art were utilized in the construction work and in making the flower bed. As a part of the English activities the children kept notes for reports and wrote business letters to

order a picture for the room. They also made a study of the picture "A School in Brittany," by Jean Geoffry. Progress notes of the work were put in the school newspaper.

There is little doubt that this unit was closely related to the lives of the children who carried it out. As it developed it motivated within the range of accomplishment of the children many activities which were varied and involved knowledge of a number of fields of subject matter. Chances for social contacts were many and the worthwhile leads which came from the different phases of the study were numerous.

It previously has been stated that health principles may be stressed but incidentally in a comprehensive unit of work. Such was the case in a review unit on "Transportation of the World," carried out in a school in which there were a number of older boys. Since some antagonism existed toward the health work the teacher decided to weave in health ideas as subtly as possible. The integrations included: discussion of ways in which people may injure their health by carrying heavy loads; the care and feeding of beasts of burden compared to man; methods of keeping food from spoiling while being transported and sources of our commonly imported foods, with emphasis on foods important to health. The teacher reported success with this unit.

If a county-wide health education program is to be adaptable to diverse teaching situations such as occur in rural areas, it must be broad in its scope and ever growing. The exchange of classroom experiences between teachers is one means of bringing about this continual growth. When a teacher has access to a wide variety of teaching suggestions from other schools she may select from them activities suitable to her own group and use them to motivate new activities in her school. This method of curriculum development

is occuring continuously in the rural schools of Cattaraugus County.

Previous articles have dealt with methods employed to bring about an exchange of experiences among the teachers.[2] Let us analyze a specific instance in which such exchanges resulted in the development of a new unit of work which possesses some elements of the old but which has unique characteristics of its own.

The unit, "Storage and Use of Foods," was initiated in an effort to increase knowledge of methods of food preservation and to encourage better balanced and more varied meals. Plans were discussed and the group decided to gather vegetables and fruits and keep them for the school hot lunches during the winter. Pamphlets and cook books were studied for best methods of preservation. A field trip was taken to collect the produce which was stored and preserved at school. A study of balanced menus followed and health books were used freely for reference. The children cooked lunches during the school year and had a special "Breakfast Party," using well-balanced menus they themselves had worked out.

According to the teacher's own account of the unit, the idea of carrying out a storage project was inspired by reading over a food storage unit in a teachers' guide.[3] Here, she thought, was something that would fit the needs of her group, particularly in one home of older children where the mother knew little about country life and the girls helped with the housework. A home-canning tomato project, described in the same book, led her to think of canning tomatoes at school.

[2]Grout, Ruth E.: A Project in Rural School Health Education. The Milbank Memorial Fund *Quarterly Bulletin*, July, 1933, xi, No. 3, pp. 201–207; *Quarterly*, April, 1934, xii, No. 2, pp. 147–159.

[3]Cattaraugus County School Health Education Project: Handbook of Health Education, pp. 156–158.

She had heard about a study of foods carried out in a neighboring school in which table setting and manners played an important part, so this she worked in with the breakfast party. She also had read an account of a group that combined a nature walk with a trip to a neighboring farm to be weighed. This made her think of the idea of taking a field trip, in this instance for studying weeds and collecting the vegetables. Original contributions of the teacher and pupils included the breakfast party, the computation of food costs for the breakfast, and the hot-lunch dishes. The unit in its entirety is distinctive and admirably adapted to the situation in which it developed.

If a program in a special field is to be workable in a school it must be in harmony with the school curriculum as a whole. In the rural schools of Cattaraugus County, where unit teaching is encouraged throughout the curriculum, the health education program has attempted to make continual use of the unit method. Since the particular field of health education is little hampered by conventional procedures it presents an excellent opportunity for teachers to experiment in newer and more progressive ways of teaching. As units of work, such as those described in this article, are applied in the different schools the teachers and pupils are gaining confidence and experience in unit activities for they find them helpful in motivating the living of health through the child's day.

AN ORGANIZED COMMUNITY HEALTH EDUCATION PROGRAM

by SAVEL ZIMAND

INNUMERABLE definitions of health education have been given, but the underlying meaning of each is the same—"the sum of all efforts to modify human conduct and attitudes so as to raise the health levels of individuals and of the community." Similarly, while it would be impossible to outline a general program of health educational activities which would be applicable in all areas without modification, there are certain basic essentials which will be found in the health educational program of almost every community. The following suggestions, many of which have grown out of several years experience in health educational activities in one health district of New York City (Bellevue-Yorkville area), may be found useful in the development of the programs of urban communities generally, especially in view of the fact that these districts have an average population of some 200,000, varying as widely in economic status and educational background as does the population of the average city.

I shall attempt here only to outline the objectives kept in mind, the methods employed, and the machinery and instruments used in carrying on a health education program on a district basis, and under official guidance, as a part of a general program for maintaining community health. Before doing so, I should like to reemphasize, however, that these suggestions are offered with a full realization that health problems vary with the locality and that therefore its health educational program must inevitably differ with the community and the individual districts in that area.

A comprehensive district health educational program

should cover three phases, however: (1) Popular health instruction; (2) health education for the professional groups; and (3) school health education. Parenthetically, it may be noted that in many localities, including New York City, this third phase is properly the function of the school authorities, but, as is shown later, there are various ways in which the official and voluntary health agencies can be of assistance to them.

I. POPULAR HEALTH INSTRUCTION

1. *Objectives.* First, it is vital that the community have a general knowledge and understanding of the work of the official health organization. Few people now realize in full the important role played by a health department in maintaining the welfare of a city, nor the various services, with a direct influence on their own and their family's life, it renders. The public should know how a health department functions; its responsibilities; the services it maintains; when and how they may call upon it for help; what constitutes a violation of health ordinances; and to whom such violations should be reported.

The other objectives might be summarized as follows: Familiarizing the community with facts related to health conservation and disease prevention; securing desirable changes in public opinion, attitudes, and habits on questions of preventive medicine and public health[1]; creating a desire for new facilities; and educating the community to utilize the medical services of a private physician or, if financially

[1]As Mary P. Connolly has stated (Connolly, Mary P.: Organization of Adult Groups for Health Education. *American Journal of Public Health*, xxiv, No. 6, Part 1, June, 1934, pp. 571–575): "In addition to personal health advice it is important in this day of too close living that men and women shall learn something about disease communication and how they may safeguard themselves; something of the principles of sanitary science, if only for esthetic reasons; something about child care and behavior which will give their children a better chance."

unable to pay for such services, to use those of the community's clinics or hospitals.

While the objective should be a well-rounded program, local conditions of the area will help determine which subjects should receive the most emphasis. The formulation of a program for a specific district will depend on research, local surveys, and a study of the vital statistics of the area. In any case it seems important, both because of the numbers affected and the opportunity for preventive work offered, that the program include, in addition to acquainting the public with the work of the health department, such subjects as venereal diseases, tuberculosis, maternal and infant care, diphtheria prevention, child hygiene in general, prevention of colds and pneumonia, dental hygiene, nutrition, the dangers of self-medication and quackery, periodic health examinations, and safety at home and in the street.

2. *Methods.* If these be the objectives of a health educational program, what are the methods to be utilized? Broadly speaking, it may be said that there are three channels for public health education:

a. *Personal instruction* of individuals through the health department's staff and other professional groups such as physicians,[2] public health and clinic nurses, and social workers and teachers, who come in direct contact with the public and are in a position to give personal advice on health matters.

b. *Small group contacts* through such community organizations as churches; Sunday and evening schools; parent-teacher associations; settlement classes; men's, women's, boys', and girls' clubs; and Boy and Girl Scouts.

c. *General propaganda* by means of printed matter, public meetings, radio talks, exhibits, et cetera.

[2]As Dr. W. W. Bauer has recently stated: "In every corner of this country the medical profession has taken up, to a greater or lesser extent, the problem of health education."

While one hesitates to give numerical values, I feel that the most valuable health education can be and is that offered by professional workers and especially private physicians and nurses who know the individuals and their home conditions and are in a position to give personal health advice. Next to this in effectiveness is the health information and knowledge given to small numbers of persons organized in special groups.

But in order to build up an informed public opinion and to secure support and assistance from the community at large, the work of these special agents must necessarily be supplemented by mass educational efforts. For measures of prevention and control of preventable diseases succeed only as rapidly as public opinion is ready to support these measures, and the general health educational activities stimulate and help to prepare public opinion.

A partial list of subjects to be stressed in a general health educational program was given earlier. While many of these subjects, depending of course on the conditions in the particular neighborhood, should receive emphasis throughout the year, *intensive drives in certain fields* will prove an effective method to force attention and create interest in a special subject. It seems desirable to select the month for a campaign well in advance and, if possible, to arrange a time when other organizations are not planning campaigns which may compete for popular interest. These campaigns can be associated with national efforts, or form part of a community-wide drive, or, on a subject needing special emphasis, can be initiated in and limited to a certain district.

A campaign calendar will naturally vary somewhat from year to year, just as the subjects vary, for certain work can be stressed more effectively during certain seasons of the year. Intensive work on diphtheria immunization seems to yield better results after the winter months, when the epidemic of colds has somewhat abated; the early diagnosis of cases of tuberculosis during April, to correspond with similar efforts by other organizations; child hygiene, nutrition, and dental hygiene during May, to fit in with Child

Health Day, or during the summer months; periodic health examinations in June or January; street safety in July and August when schools are closed and the children are more apt to be on the streets; health examinations for children in the latter part of August and in September, before they enter school.

3. *Machinery.* To prepare a community for intensive health educational work and to create an attitude of acceptance and cooperation on the part of organized groups require the setting up of certain machinery. This might include:

a. A *house council* composed of executives and other personnel of the local health department who, through staff meetings, would familiarize themselves with the work under way and discuss subjects of mutual interest, thus enabling them to convey to the public a better picture of the public health activities as a whole.

b. A *community health council* composed of representatives of the medical, dental, and pharmaceutical professions; local hospitals; churches; adult club groups; parent-teacher associations; and local health, welfare, and civic organizations, official and voluntary. This council would keep the organized groups of the community in touch with the public health activities and assist in the dissemination of health knowledge to the public. From this council, a small advisory board might be selected to advise on programs, policies, and work. This advisory board might in turn appoint from its members a sub-committee on health education.

c. A *school health council* composed of representatives of the public and Catholic schools. For example, the personnel of this council might include the assistant director of health education for the public schools of the community, a similar officer from the Catholic schools, district school superintendents, principals from selected schools, a special health teacher, the district supervisory nurse, a representative from the parent-teacher association, and the health officer.

The objective of this school health council would be the

furtherance of cooperation among home, school, and community; to correlate the work of the health department with the work of the schools; to advise on the aspects of health work which need special emphasis and how the schools can assist in health campaigns carried on in the community; to help further the health activities of the parent-teacher organizations; and to develop plans for special follow-up of school children needing medical attention. Another group which can be of great assistance in this activity is the local school board.

In general, health education for children of school age is primarily the responsibility of the schools, but the organization of a school health council is one practical step which the local health department can take in the field of school health education.

d. A *lecture bureau* recruited from the physicians, nurses, teachers, civic, and social workers of the locality.

e. A special *force of volunteers* recruited for the distribution of literature.

4. *Instruments.* The instruments now popularly used for the dissemination of health knowledge include printed matter, lectures and meetings, exhibits, talkies, films, slides, pageants, parades, press and radio publicity, et cetera.

a. *Printed Matter.* Popular pamphlets, leaflets and posters on health subjects, bulletins, circular letters, and announcements for meetings all come in this category.

In addition to leaflets and pamphlets on special subjects, a popular *tabloid newspaper*, printed by the department of health for the community as a whole, with special information on the services of each local district, might be found useful. This has already been tried in various communities and found to be a most effective method of popularizing health information.

Another valuable aid is the educational poster, displayed in neighborhood stores, school classrooms, social agencies, hospitals, clinics, industrial plants, moving picture houses, et cetera. The cardboard poster has been found most prac-

tical for the stores, as the paper one is difficult to display. For the others, the paper poster, which is less expensive, might be used. The poster used for general display may not always be adaptable for classroom use.

There are certain fundamentals which it is wise for the copy writer to bear in mind: (1) All health educational material should be written in clear, simple, and picturesque language, and the statements should be in accordance with the known facts of medicine and public health. (2) No single article, leaflet, or poster should try to make too many points. (3) The form should be attractive and designed to appeal to the eye, and the material should be related to the daily experience of the people to be reached.

A *mimeographed monthly bulletin* presenting important phases of the work and local health news may be useful for agencies of the area in making the work known to their clients.

Preparation of *special mimeographed material* for teachers of special groups or classes of adults is desirable, as for instance, information on disease communication, sanitary science, prenatal care, child care and behavior, safety, et cetera.

b. *Distribution of Literature.* On the effectiveness of the distribution of the literature depends whether the message will reach the people for whom it is intended.

Health bulletins and circular letters to agencies, industrial plants, churches, et cetera, will probably have to be sent by mail, but literature to special groups of the community can be distributed by several methods. The physicians can be asked to keep the literature in their waiting rooms, and at times may be willing to include certain messages when writing to their patients. The nurses can, on their daily visits, carry it into the homes. The clinics and hospitals can distribute it to their patients. The schools will undoubtedly be glad to cooperate, especially in the distribution of literature on child health. (There are, of course, other types of printed matter which cannot be sent home by the school child.) The church associations and groups can also help.

Commercial organizations and chain stores or department stores may be willing, during certain campaigns, to include with each package a leaflet sent out from the health department. Church bulletins and house organs of local agencies can give wide circulation to health messages. At lectures and meetings copies of appropriate literature can be distributed after the talk. Industrial plants will sometimes include a health leaflet in the pay envelopes, post it on bulletin boards, reprint it in the house organ, or arrange for its distribution during the lunch hour. The libraries of the community can be asked, from time to time, to display books on special subjects emphasized by the department.

For general distribution to the families of a selected area, we have found the house-to-house canvass a most effective way of reaching the entire district. But, if done by a commercial agency, this would be too costly. A group of volunteers, such as the older Boy Scouts, might agree to do this on special occasions.

All these methods are presented as practical suggestions. The one to be used will depend on the conditions in a particular community. Somewhat more intensive distribution of literature may have to be done within certain districts of the areas where conditions demand it. But the fact should never be overlooked that effective distribution necessitates careful planning as well as periodic check-up through the health department nurses and other workers.

c. *Lectures.* Mention has been made of the desirability of organizing a lecture bureau. It should be possible to select physicians from the staff of the local health department and others with the assistance of the medical societies. It seems important to select as lecturers physicians who are specialists in the field on which they are to talk, and who can get their message across to the particular audience which they address. It is also very important to see that practicing physicians of the area are brought into this picture, for it is they who can wield the greatest influence with the people of the community. In this connection, it may also prove desirable and practical to organize a course for training lecturers.

Lectures or meetings might be held at the offices of the health department; at the headquarters of social, civic, and welfare agencies of the area; at schools and churches; in connection with parents' and teachers' meetings; or, in some instances, at industrial plants during noon hours. Sometimes arrangements can be made to give short talks at movie houses.

To secure a good attendance at either a general meeting or special lecture requires careful preparation. The technique of approach will vary with the type of audience for which the meeting is arranged. The cooperating agencies of the area and the clinics can assist by posting notices on their bulletin boards and also by distributing such notices to their clientele. Publicity can be secured through the local papers, church bulletins, house organs, and other local news sources.

d. *Exhibits, Pageants, Et Cetera.* Certain health messages can be dramatized through parades and pageants, and by exhibits displayed in empty store windows. Motion pictures, as well as visual instruction in general, are important educational instruments. Health films can be shown in connection with meetings and lectures. These films can be secured in some localities either from the state or city health departments or borrowed from national health organizations, insurance companies, and occasionally through the schools, which are increasingly making use of visual instruction. It would be useful for each local health department to own a 16 millimetre moving picture projector and to acquire a number of educational films which can be routed to the various districts.

e. *Information Service.* If the educational work is carried on effectively, a great many inquiries will come by mail, telephone, and personal call. A great amount of the mail will probably have to be handled by the health officer, or by the assistant in charge of health education. If the health department has no reception clerk, it is desirable that a member of the staff be assigned to answer telephone and personal inquiries about the health facilities of the area. Such a person can open new resources to people by making

contacts for them with various workers in the building and in the community as a whole.

f. *Press and Radio.* A health department with an active program will inevitably have frequent items of news interest to report. Local and city-wide publicity should be frequently arranged by the department. The release will best serve its purpose if prepared along certain definite lines of newspaper procedure. A human interest story will help put across the message to the public. In making public vital statistics, it is necessary to put meaning into them for the ordinary citizen. The *city-wide papers* are more likely to carry the message if it contains something of general interest. The *local, foreign language, and trade newspapers* also constitute a fruitful field for imparting health information. Personal contact should be made with the staff of the various papers of the area. Often it is valuable to arrange a conference to explain to the newspaper men the object of a particular campaign and ask cooperation in publicizing the message.

The *radio* is another avenue of publicity which should be employed whenever possible. Naturally, the topics should have a community-wide appeal. Radio broadcasts can be best arranged through the main office of the department. It is important that the speaker have a good radio voice and be able to present his subject in an interesting and convincing way. Instead of having the radio address delivered by one person we have found it best to present the subject in dialogue form, and with music or singing forming part of the broadcast. Volunteers can often be utilized for this. In some communities it may be possible to organize regular radio classes.

II. HEALTH EDUCATION FOR THE PROFESSIONAL GROUPS

1. *Objectives and Methods.* The teaching of preventive medicine is the function of the medical school, and the teaching of public health work as a profession, of the special schools in that field. But the health department can and should put at the disposal of the professional groups its facilities, with

their continuous opportunities for illustrating preventive medicine and public health methods in practice; furnish to physicians, dentists, nurses, social workers, and teachers information relating to preventable diseases and other aspects of public health; collect and disseminate neighborhood health data and information on the work of the department; and stimulate the professional groups to participate actively in public health work in general and in the activities carried on by the department.

Facilities might be made available for field work by medical and nursing students assigned for that purpose. Educational activities might also include conferences and discussions with physicians, fourth-year medical students, nurses, et cetera, on problems of importance to them.

Naturally, it is essential to establish close working relationships between the professional groups and the department. One of the best means by which the physician can become acquainted with the official public health activities of the community is through such services as the consultation chest service for private physicians and culture stations for diagnostic purposes.

A moderately well-equipped library, with professional journals and other current printed matter, is another method which can be used to attract the professional group to the department's work. There should, of course, be a special room for this purpose. Setting aside one day for visits by professional workers may also serve to acquaint them with the various services carried on by the department.

2. *Machinery and Instruments.* The house council, composed of the personnel of the department; the community health council, composed of representatives of the health, welfare, and civic agencies of the community; the district school health council; the county medical society; the local

medical and dental societies; and other professional groups of the community, listed earlier, are the logical bodies to assist in mapping out this program. As in the case of popular health education, the chief instruments available for use are the printed word, lectures, and exhibits.

a. *Printed Matter.* The health department can frequently communicate with the professional members of its area by means of a mimeographed bulletin. This bulletin should keep them informed of the work of the department, especially the services offered to physicians and the research projects under way, as well as the health situation in the locality. For example, the Department of Health of New York City is now sending a bulletin to the physicians of Greater New York containing information about the various activities of the Department and about the City's vital statistics. The mailing of annual reports and interesting reprints of scientific articles will also be welcomed by the professional groups. Medical bulletins of the local societies are frequently open for the publishing of health messages by the department.

b. *Lectures and Post-Graduate Medical Conferences.* These might include special courses for the various groups, such as: A post-graduate course on tuberculosis, venereal diseases, or child hygiene for physicians; a general course, which might be of interest to all the professional groups, on such subjects as the history and scope of the public health movement, general principles of control of communicable diseases, general introduction to the subject of vital statistics, diseases of adult life, personal hygiene, sanitary laws, epidemiology, et cetera; and courses on social and mental hygiene, nutrition, and dental hygiene for teachers. A course might also be given for classroom teachers on a subject such as the principles and practices of health teaching, to include: (1) A discussion of the principles of teaching and learning as they apply to healthful living; (2) discussion of situations, activities, and materials, and their use in the program; (3) guidance of the group in

reorganizing and solving problems; and (4) helping the teachers in planning programs. These courses for teachers might be given either by a member of the Department of Education or by an authority in the field.

A course for training speakers can perhaps be established, students to be recruited from the local physicians or other interested groups, and the subject matter to include voice, diction, relation of speaker and audience, posture, poise, personality, et cetera.

c. *Exhibits.* It may prove possible to arrange exhibits for physicians and other groups. These can deal with matters of scientific interest such as X-ray films.

III. SCHOOL HEALTH EDUCATION

As mentioned earlier, health education in the schools in various parts of the country, including New York City, is the responsibility of the schools. This phase of health education is therefore not discussed here except in a general way. As a practical step of cooperation between the schools and the health department, the district school health council outlined at that point will prove useful.

Health education in the schools implies a practical program of health education with a place in the school curriculum, not as a separate subject, but as an all-day influence, with healthful living stressed in relation to all activities. Aside from the principles, as well as the application, of personal hygiene, the goal should be to give the children such information as the importance of nutrition and the value of various foods; the necessity for sunlight, fresh air, and proper ventilation; the need for ample sleep, recreation, rest, and exercise; the importance of observing laws regarding sanitation; and the desirability of periodic health examinations and dental visits. Furthermore, cooperation between home and school should be stressed and the pupils encouraged to carry the health programs into their home.

SUMMARY

While I have attempted in this paper to point out the principal methods, machinery, and instruments which may be used effectively in carrying out the three broad phases of a community-wide health educational program, I should like to emphasize again that the success of the undertaking will depend largely upon careful, long-range planning as well as upon the intensive consideration of the individual details. As Professor Winslow recently wrote, an organized program of popular health instruction should keep certain conditions always in view:

> "It must bring to the people only what is established on a sound scientific basis. It must present its facts with the most effective technique, as to selection of content and form, so as to make the essential facts clear and to arouse an effective desire to apply them. And, finally, the program must be so planned as to emphasize those things which are vitally important and to do so at the times and under the conditions where application of the principles in question can most easily and effectively be made."

DIETS OF URBAN FAMILIES WITH LOW INCOMES[1]

AN ANALYSIS OF WEEKLY FOOD BUDGETS OF 472 FAMILIES IN BALTIMORE, CLEVELAND, DETROIT, PITTSBURGH, AND SYRACUSE IN APRIL-MAY, 1933

by DOROTHY G. WIEHL

THE changes in diet made by families which suffer loss of income and the adequacy and nutritional balance of the dietary of families on relief and of families earning barely enough to maintain themselves without aid are questions very pertinent to an understanding of the health of the large number of American families which for several years have been forced to adjust their standard of living downward. Although the present study does not attempt to answer these questions precisely, the data do give, it is believed, a good indication of the type of dietary which prevailed in low-income families and of the insufficiencies which are most likely to arise from such a diet. The family food budgets on which this study is based covered a period of only one week; for the individual family this does not afford sufficient data on which to measure the extent to which the diet was lacking in the various nutrients which the science of nutrition has found to be essential, and for some of which minimum requirements are now fairly

[1]From the Division of Research, Milbank Memorial Fund and the Office of Statistical Investigations, United States Public Health Service. This is the third report on diets of workingmen's families and is one of a series of articles on health and the depression based on a survey of families in ten cities made by the United States Public Health Service in cooperation with the Milbank Memorial Fund. The method and scope of the survey were described in Sickness and the Depression, by G. St. J. Perrott and Selwyn D. Collins, Milbank Memorial Fund *Quarterly*, October, 1933, xi, No. 4, pp. 281–298, and the method of collecting and tabulating the data on diets was outlined in the first report, Diets of Low-Income Families in New York City, Milbank Memorial Fund *Quarterly*, October, 1933, xi, No. 4, pp. 308–324.

well standardized. However, averages for groups of families of comparable economic status are reasonably reliable even for this short period, and from the average food supply one may draw certain broad conclusions as to the quality of the diet and the adequacy of the supply of certain kinds of foods.

The data presented are for 472 families in Baltimore, Cleveland, Detroit, Pittsburgh, and Syracuse. Since tabulations of the records by individual cities did not suggest any basic differences in food habits of families in these cities, they are combined. The records in all of these cities were obtained for a week's period late in April or in the first half of May, 1933. All families on relief are grouped together, although some had cash relief, with and without work, others received grocery orders, and a few families received food boxes; they represent a random sample of families receiving aid from some organized agency in these five cities. The other families are classified according to the money per capita available for expenditures in the week of the food record.

ENERGY VALUE OF FOOD SUPPLIES

The quantity of food needed to provide the energy used by the human body in its internal processes and in performing muscular activities is measured in terms of the calories available in the food to supply this energy. Individual requirements for energy vary according to age, sex, body weight, and type of activity, and have been carefully measured, but in the present type of study, average needs must be used for measuring the requirements of groups of individuals. Various standards of average calories needed by persons of a specific sex and age have been prepared and that used in this study was furnished by the Bureau of Home Economics of the United States Department of Agriculture. A daily supply of 3,000 calories is taken as adequate for the

adult male at moderate activity. Using this as a base, the energy needs of persons of each sex and age are expressed as a percentage; for each one hundred per cent or equivalent of an adult male in the population, there should be food yielding 3,000 calories per day. The scale of proportional requirements by sex and age used was found to give average requirements for population groups that were very close to those based on other scales, in spite of slight differences in the allowances for some age groups.[2]

Various nutritionists have outlined diets which supply what are considered more nearly marginal requirements for family groups. Many of these would yield from 2,600 to 2,700 calories per day per adult male unit on the basis of the scale of proportional requirements by sex and age used in this study.

There is some evidence that food allowances for adults can be lower than these average standards for adequate energy value without ill effects, except for persons who are very active. Children, however, need ample food to keep them in good health while growing, and the trend in recent years has been to increase food allowances for children, especially those in the "teen" ages, as compared with the earlier

[2]Comparisons were made of the requirements for energy value for families in the various income classes if different scales were used and the maximum variation was about five per cent, with differences of less than three per cent more frequent. Scales compared included: (1) that given in *A Laboratory Handbook for Dietetics* by M. S. Rose, Ed. 3, 1929, New York; (2) scale used by United States Bureau of Labor Statistics in study of "Standard of Living of Employees of Ford Motor Company in Detroit" and other studies; (3) caloric requirements agreed upon by Nutrition Committee of the British Medical Association and the advisory committee of the British Ministry of Health. The latter scale gave the greatest differences, its requirements being somewhat higher, especially the adequate values for men at moderate work which are taken as 3,000 to 3,400 calories. The mean value was used for comparison in all cases in which a range was given. These various scales provide for fully adequate or liberal amounts of food, and include a small allowance for household waste.

standards. By reducing the allowance for adults to an approximate minimum, we can make some estimate of the marginal fuel value required for the family to have an adequate food supply for children in these lowest income families. For males an allowance of 2,600 calories per day and for females an allowance of 2,200 calories, a little above the minimum standard for persons in sedentary or light occupations, has been taken as marginal.[3] If it is assumed that adults consumed only this amount, when the average calories per adult male unit based on the normal or adequate scale equal 2,750 for a group of families, the adjusted value for children would be about 3,000 or adequate; when the average is 2,600 the adjusted value is approximately 10 per cent below the fully adequate standard for children.

Although there is no absolute figure below which the calories in the food supply cannot fall without endangering health, an average daily energy supply of about 2,700 calories per adult male unit seems to be a reasonable minimum for ordinary population groups, and an adequate supply of 3,000 calories is desirable, to assure full provision for growing children and protection of the vitality of adults.

Calories According to Income. When the income for the week was $3 or more per person, the average family in these five cities had a food supply which furnished something over 3,000 calories per day per equivalent adult male (see Table 1). Below this income level, the calories available from the average food supply were less than 3,000. For families whose income was less than $2, the calories averaged approximately 2,500 per day, and families on relief, on the average, had a diet higher in energy value than that of this lowest income

[3] A study of food consumption by research and technical persons in the School of Hygiene, University of Toronto, Canada, reported an average of about 2,530 calories per day for males and 2,040 for females. McHenry, E. W.: Dietary Standards. *Canadian Public Health Journal*, July, 1933.

Weekly Income per Capita	Number of Families	Calories per Day[1] per A.M.U.	Per Cent of Families Having Specified Calories			
			Less than 2,200	2,200–2,699	2,700–3,399	3,400 or More
Relief	177	2,700	24.9	32.2	25.4	17.5
Less than $2.00	77	2,470	27.3	33.8	31.2	7.8
$2.00–$2.99	60	2,800	16.7	35.0	28.3	20.0
$3.00–$3.99	46	3,180	13.0	8.7	41.3	37.0
$4.00 or more	112	3,350	4.5	17.0	33.0	45.5

[1]Average of the calories per day per adult male unit for each family, i.e., each family has the same weight in the average regardless of its size.

Table 1. Average calories per day per adult male unit for families of various incomes and distribution of families according to calorie supply. Based on records of a week's food supply for 472 families in Baltimore, Cleveland, Detroit, Pittsburgh, and Syracuse, April-May, 1933.

group, their food supply yielding 2,700 calories per day, approximately equal to the average caloric value of the family diets recommended for emergency use.

If we assume that the adults in these lowest income families consumed only the reduced share of the food that was suggested above as minimum for adults and distribute the remainder of the food supply among children under 18 years of age, we can approximate the extent to which the children's food supply fell below an adequate amount. This would be a minimum estimate, since the allowance for adults is very low. The following estimates of calories per day per adult male unit for children in low-income classes result:

Relief families: 2,860 calories, or 5 per cent less than adequate

Less than $2.00 per week: 2,410 calories, or 20 per cent less than adequate

$2.00 to $2.99 per week: 3,200, or more than adequate

It seems very probable, therefore, that many children in

families with less than $2 per week per person were seriously underfed. The average relief family is again found close to the borderline.

Within each income class, the calories in the individual family food supply varied over a wide range and the distribution of families according to the caloric value of their food supply also is shown in Table 1. About one-fifth of the families with $3 or more per week reported food yielding less than 2,700 calories per day, but three-fifths of the families with less than $2 and nearly as large a proportion of the families on relief had less than 2,700 calories. In these two lower income classes, about one-fourth of the families had less than 2,200 calories per day per adult male unit. It must be remembered that we are dealing with food records for one week and the food supply of families with such very limited incomes may vary considerably from week to week, so we cannot assume the same food supply over long periods, even though practically all of the families reported it as "usual." Also, there is opportunity for relatively large error in both the reporting and the estimating of weights of items for which only price or number of units, such as cans, packages, et cetera, was stated. These errors tend to compensate each other and average out when we consider the food supply of groups of families but cannot do so in a one week's record for an individual family. Nevertheless, the conclusion seems justified that, among families with a weekly income of less than $3 per person or on relief, a large proportion had a food supply much below any reasonable marginal quantity necessary to maintain them in health. Among families with less than $2 per week a number of those in the class of less than 2,200 calories reported very acute food shortages.

According to Changes in Income (1929 and 1933). How does the food supply of families whose experience with poverty

1929 Annual Income per Capita	Number of Families	Calories per Day per A.M.U.	Per Cent of Families Having Specified Calories			
			Less than 2,200	2,200–2,699	2,700–3,399	3,400 or More
1933 WEEKLY INCOME LESS THAN $3.00 PER CAPITA OR RELIEF						
Less than $150	61	2,420	36.1	34.4	18.0	11.5
$150–$424	166	2,660	24.7	31.9	30.1	13.3
$425 or more	79	2,910	12.7	30.4	31.6	25.3
1933 WEEKLY INCOME $3.00–$7.99 PER CAPITA						
$150–$424	66	3,210	7.6	15.2	37.9	39.4
$425 or more	61	3,250	8.2	16.4	34.4	41.0

Table 2. Caloric value of food supply of families according to their economic status before the depression and their incomes in the week of the food record, April-May, 1933.

has been short compare with that of families which might be termed the "chronic poor?" In Table 2, families on relief or with less than $3 per person when the food records were obtained are divided into three classes according to their 1929 annual per capita income, and families with $3 to $8 for the week of the food record are divided into two classes according to their 1929 income. The average calories provided by the food supplies of families with $3 to $8 were sufficient and were the same regardless of whether or not the family had suffered a drop in income since 1929. But for families below the level of $3, or on relief, differences in the adequacy of the food supply were associated with the previous income of the family; those who had been poor even in 1929 had the least food with an average of 2,420 calories per day per adult male unit, and the families which, in 1929, had been fairly comfortable had the most food with an average of 2,910 calories per day.[4] Thus, the "new poor," on the aver-

[4]Families with less than $2, $2 to $3 per week, and those on relief were grouped together to give larger numbers of families in each class, but the same tendency for those formerly in a higher income class to have more food

(Continued on page 350)

age, seem to be more successful than the "chronic poor" in providing a food supply with adequate energy value, although their food supply was less than that of neighbors whose income was higher.

The distribution according to calories of individual families in the group of "new poor" ($425 or more in 1929 to less than $3 per week in 1933) is of interest since the average for the group was approximately adequate and only 10 per cent less than the average for families of higher incomes in 1933 but the same income in 1929. Forty-three per cent of the "new poor" had less than 2,700 calories, which is probably marginal for energy requirements, compared with 25 per cent of the higher income families. Among the "chronic poor" families, 36 per cent reported a very limited food supply with less than 2,200 calories per day, and 13 per cent of the "new poor" had less than 2,200 calories. (Table 2).

Size of Family and Food Supply. More large families in each income class were found to have an insufficient quantity of food than small families, even though income groupings were on a per capita basis. Families with not more than four persons had an average food supply that was fairly adequate though the income was less than $3 per person (see Table 3) but larger families had less than 2,700 calories.

The very large families on relief seem to have fared espe-

than those with very little income for several years is shown for families in each of these three low-income classes. The average energy value in the food supply of families of different incomes in 1929 is given below.

Annual Income per Capita in 1929	Income per Capita in 1933					
	Relief Families		Less than $2 per week		$2–$2.99 per week	
	Number	Calories per A.M.U.	No. of Families	Calories per A.M.U.	No. of Families	Calories per A.M.U.
Less than $150	38	2,490	17	2,140	6	2,760
$150–$424	92	2,680	43	2,560	31	2,710
$425 or more	41	2,990	16	2,560	22	2,960

Size of Family	Number of Families	Calories per Day per A. M. U.	Per Cent of Families Having Specified Calories			
			Less than 2,200	2,200–2,699	2,700–3,399	3,400 or More
FAMILIES ON RELIEF						
1–4 persons	62	2,910	11.3	35.5	27.4	25.8
5–6–7 persons	81	2,670	24.7	35.8	25.9	13.6
8 or more	34	2,430	47.1	17.6	23.5	11.8
LESS THAN $3.00 PER PERSON PER WEEK						
1–4 persons	37	2,880	18.9	24.3	29.7	27.0
5–6–7 persons	70	2,530	21.4	42.9	27.1	8.6
8 or more	30	2,570	30.0	26.7	36.7	6.7
$3.00 OR MORE PER PERSON PER WEEK						
1–4 persons	89	3,400	5.6	16.9	27.0	50.6
5–6–7 persons	57	3,180	7.0	14.0	45.6	33.3
8 or more	12	3,190	16.7	0	50.0	33.3

Table 3. Calories in food supply according to size of family and income. Based on records of a week's food supply for 472 families in Baltimore, Cleveland, Detroit, Pittsburgh, and Syracuse, April-May, 1933.

cially badly. Families consisting of eight or more persons reported, on the average, a food supply furnishing only 2,430 calories per adult male per day, and nearly 50 per cent of them had less than 2,200 calories.

Nativity of Family Heads and Food Supply. Families in which the husband and wife were native-born of native parentage had approximately the same amount of food as those of similar incomes in which the family heads were native-born of foreign-born parents or foreign-born. The number of families in each group was small when families were subdivided by income and nativity, and the differences in the caloric value of the food supply of the various groups did not appear to be significant.

AVERAGE FAMILY DIETARIES

In addition to sufficient energy value from the food eaten,

the human body must be provided with an adequate supply of each of a number of essential nutrients. Most American diets with adequate fuel value are well supplied with protein, carbohydrates, and fat. Equally important to insure health and proper growth of children are the mineral elements and the vitamins and care in the selection of foods is necessary to assure minimum amounts of each of these.

For the purpose of judging the approximate adequacy of various food elements in the dietary of these families, the amounts of specific kinds of foods reported are compared with amounts recommended as providing at a minimum cost an adequate supply, though not liberal or optimal amounts, of the essential nutrients. A further comparison is made with a more restricted dietary which is designed to furnish "approximately the minimum requirements of the body for the various nutrients, but allows little margin for safety. . . . It represents quantities of 'protective' and other foods below which it is not safe to reduce the food supply."[5] From the requirements for each type of food given by Stiebeling and Ward[6] to supply persons of each sex and different ages, with an adequate diet at minimum cost an average amount per week per adult male unit was computed which is used as a

[5]See Stiebeling, Hazel K. and Ward, Medora M.: Diets at Four Levels of Nutritive Content and Cost. United States Department of Agriculture, Circular No. 296, p. 4.

[6]*Op. cit.* pp. 14–19. Since the required amounts of each nutrient do not vary by sex and age according to the adult male unit scale, which is based on calorie needs, the average amounts of specific foods in a dietary for families or groups of persons must be adjusted. The amounts recommended for a specific sex-age group for a restricted diet and for a minimum cost diet were weighted according to the sex-age composition of the population of different income classes, and the total divided by the number of adult male units in the population. For most foods the average per adult male unit for different income classes was affected very little by differences in the age composition, and a single average was taken as the standard for comparison with amounts actually purchased. Since the average quantity of milk varied considerably the specific average for each income class has been used for comparison.

standard for a minimum cost adequate dietary. Similarly, average amounts in the restricted dietary were computed to obtain a standard with which amounts actually purchased can be compared.

Moderate-Income Families. The average supply of various kinds of food in the dietary of families with $3 or more per week, a group which had an adequate quantity of food to supply energy requirements, is shown in Table 4. These families had about as much or more than the recommended quantities of all foods except dried legumes, dried fruits, and milk. The foods showing the greatest excess over recommended amounts were meat and fish, eggs, tomatoes and

Table 4. Average amount of various foods per week reported by families with $3.00 to $3.99 and by families with $4.00 or more per person per week in five cities, April-May, 1933.

Kind of Food	Standard for Adequate Diet[1]	Pounds per Week per A.M.U. for Families with Income of		Per Cent Above or Below Standard	
		$3.00–$3.99	$4.00 or More	$3.00–$3.99	$4.00 or More
Milk, and equiv. cheese—qts.	5.40	3.80	4.06	−30	−25
Meat and fish	1.15	2.28	2.73	+98	+137
Eggs	.57	.91	1.09	+60	+91
Potatoes	3.27	4.30	4.26	+32	+30
Tomatoes and citrus fruit	1.16	1.68	2.13	+43	+84
Vegetables, canned and fresh	2.25	2.41	2.83	+7	+26
Leafy, green or yellow	1.94	1.87	2.09	−4	+8
Fruits, fresh and canned	1.55	1.65	1.97	+6	+27
Legumes, dried and canned, nuts	.57	.17	.10	−70	−82
Dried fruits	.45	.09	.12	−80	−73
Fats and fat foods[2]	.95	1.06	1.32	+12	+39
Sugar, syrup, jelly	.90	1.52	1.57	+69	+74
Bread and equivalent cereals	6.01	6.25	6.42	+4	+7

[1]See footnote 6.

[2]Includes lard and substitutes, butter and substitutes, vegetable oils, bacon and pork sausage, and cream; the latter was reported rarely.

citrus fruits, and sugar. Although these families had more than sufficient lean meat and eggs, and substitution of milk and fresh vegetables for some of these would give a more liberal supply of calcium and vitamins, and although a less expensive diet could have been provided by using more dried fruits and legumes, the foods actually used would provide a satisfactory diet.

Present nutritional standards emphasize the consumption of milk by adults, and the standard amount for an adequate diet given in Table 4 includes a pint of milk a day for all adults. In at least half the families in these higher income classes it was reported that no adults drank milk and, in many other families, adults seem to use very little of the family supply.[7] On the basis of a quart of milk a day for each child under 18 years of age, the average per adult male unit for these families would be 3.6 quarts and the amount purchased was somewhat above this. Thus, these families had enough milk to provide liberally for their children, but not the suggested quantity for adults.

Lowest Income and Relief Families. The choice of foods of families whose incomes were less than $2, $2 to $3 per person per week, and also of relief families, is shown in Table 5, which gives the average quantities of various foods or groups of foods. The limited quantity of food available to the families in these income groups makes it very important that the quality of the diet be guarded by a wise selection of foods.

The proportionate amount less of the various foods used by these low-income groups than by their neighbors in the highest income class is given in Table 6. The greatest reductions, if we may assume that these families would have had

[7]The information was not definite as to how much milk was consumed by individual members of the family but the general question was asked as to whether the milk supply was used by children, adults, or both.

a food supply similar to that of the higher income families had more money been available, were made in the amount of citrus fruits and tomatoes, fresh and canned vegetables, meat, eggs, fresh and canned fruit, and milk; and the percentage reduction ranked in about the order named, with the citrus fruits highest, for each income class. The costliness of the food in relation to its "filling value" seems to have determined its use rather than any understanding of the importance of certain foods as sources of essential nutrients.

The percentage variation of the average supply of each group of foods from the standard requirement for an adequate low cost diet is shown in Figure 1 for families in each

Table 5. Average amount of various foods per week reported by 472 families of different incomes in five cities, April-May, 1933.

Kind of Food	Standard Restricted Diet[1]	Pounds per Week per A.M.U. for Families of Specified Income			
		Relief Families	Weekly Income per Capita		
			Under $2.00	$2.00–$2.99	$3.00 or More
Milk, and equiv. cheese—qts.	3.95	3.29	2.42	2.87	3.97
Meat and fish	.56	1.25	1.37	1.77	2.60
Eggs	.30	.73	.62	.90	1.03
Potatoes	3.32	4.34	3.91	4.16	4.27
Tomatoes—citrus fruit	1.21	.89	.77	1.18	2.00
Vegetables, fresh—canned	1.18	1.71	1.31	1.60	2.70
Leafy, green, yellow	1.02	1.20	.90	1.26	2.02
Fruit, fresh—canned	.75	.89	1.15	1.37	1.88
Legumes, dried—canned, nuts	.54	.23	.12	.20	.12
Dried fruits	.22	.15	.08	.10	.11
Fats and fat foods[2]	.85	.91	.78	.95	1.25
Sugar, syrup, jelly	1.03	1.27	1.22	1.23	1.56
Bread, and equiv. cereals	6.67	5.80	5.73	5.95	6.37

[1]See footnote 6. For milk the average requirements for each income class are: relief—3.95 qts.; under $2—3.76 qts.; $2.00–$2.99—3.64 qts.; $3 or more—3.55 qts.

[2]Includes lard and substitutes, butter and substitutes, vegetable oils, bacon and pork sausage, and cream.

Kind of Food	Per Cent Variation from Average Amount for Families with $3.00 or More			Per Cent Variation from Standard for Restricted Diet			
	Relief Families	Less Than $2.00	$2.00-$2.99	Relief Families	Under $2.00	$2.00-$2.99	$3.00 or More
Milk and equiv. cheese	−17	−39	−28	−17	−36	−21	+12
Meat and fish	−52	−47	−32	+123	+145	+216	+364
Eggs	−30	−40	−13	+143	+107	+200	+243
Potatoes	+2	−8	−3	+31	+18	+25	+29
Tomatoes—citrus fruit	−55	−62	−41	−26	−36	−3	+65
Vegetables, fresh-canned	−37	−52	−41	+45	+11	+36	+128
Leafy, green, yellow	−41	−55	−38	+18	−12	+24	+98
Fruits, fresh—canned	−53	−39	−27	+19	+53	+83	+151
Legumes, dried—canned, nuts	+92	0	+67	−57	−78	−63	−78
Dried fruits	+36	−27	−9	−32	−64	−55	−50
Fats and fat foods	−27	−38	−24	+7	−8	+12	+47
Sugar, syrup, jelly	−19	−22	−21	+23	+18	+19	+51
Bread, and equiv. cereals	−9	−10	−7	−13	−14	−11	−5

Table 6. Percentage variation of the food supply of lower income groups from that of families with $3.00 or more per person per week and percentage deviation from the standard for a restricted diet.

of the income classes. In spite of a much lower consumption of meat and eggs than in the higher income families, the average amount reported by the lower income and relief families was in excess of the standard for a minimum cost adequate diet. Sugar and potatoes were used in greater amounts also than called for by this standard, the latter being preferred apparently to bread and cereal foods, since the amount of bread was reduced more than the amount of potatoes. The foods used in smaller quantities than those recommended as adequate were fresh and canned vegetables and fruits, legumes, dried fruits, and milk. On the average, these families, which had marginal, or less than marginal,

amounts of calories, were well supplied with animal protein foods but neglected especially the foods necessary for adequate provision of vitamins and mineral elements in the diet.

The probable deficiencies in the food supply of these families are suggested by comparing the average amounts used with the standard for a restricted diet, which provides a minimum of specific food factors for safety. The percentage variation of the average supply of various foods from this standard is shown in Table 6 and Figure 2 for families in the different income classes.

The relief families and those with $2 to $3 had more than the restricted standard for potatoes, fresh and canned vegetables, fruits except citrus, fats and sugars, the per cent in excess of need varying from 7 and 12 for fats, to 45 and 36 per cent for all fresh and canned vegetables, and 83 per cent for fruits used by families with $2 to $3. The amounts of meat and fish and eggs were two to three times the suggested quantity.[8] Families in these two income classes used from one-third to two-thirds less than the suggested quantity of dried legumes and dried fruits, a little more than 10 per cent less than the recommended amount of bread and cereals and 17 and 21 per cent less milk. The average use of tomatoes and citrus fruits by families in the two-dollar income group was approximately equal to the restricted standard, but relief families were 26 per cent below need.

The shortage of milk is undoubtedly the most serious lack in the dietary of these families, since it is less than the amount needed to furnish one pint of milk a day for children and women and one-half a pint for men. Milk is the chief

[8]The amount of meat and fish allowed by this restricted emergency diet is only a little more than half that allowed by some standard diets for relief families. Thus, the bulletin on "Food Allowances" issued by the Temporary Emergency Relief Administration of New York, August 15, 1932, recommended approximately one pound of meat and fish per equivalent adult male.

source of the calcium and phosphorus which are so necessary to the growing child and in this restricted dietary provides about two-thirds of the calcium and two-fifths of the phosphorus. The other third of the calcium supply is obtained largely from vegetables and fruits and since the average supply of these foods was low, the amount of dried legumes and fruits being much below that recommended, the calcium in the average diet of the relief families is from 5 to 10 per cent less than the amount in this restricted dietary, and that in the average diet of families in the $2 income class was approximately 15 per cent less. Since phosphorus is obtained from meat and eggs and from many other foods, the supply in the average diet of relief families was about equal to that in the restricted dietary, but the average for families in the $2 class was about 10 per cent less.

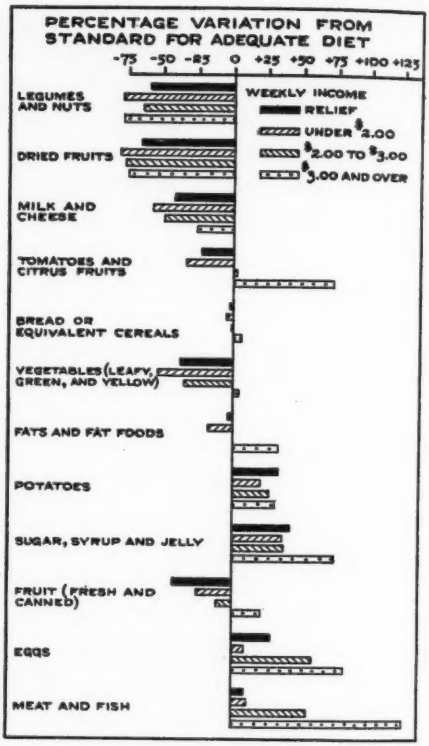

Fig. 1. Per cent more or less of each kind of food than the quantity recommended for an adequate low-cost diet in the average weekly food supply of families of different weekly incomes per capita, in five large cities, April–May, 1933.

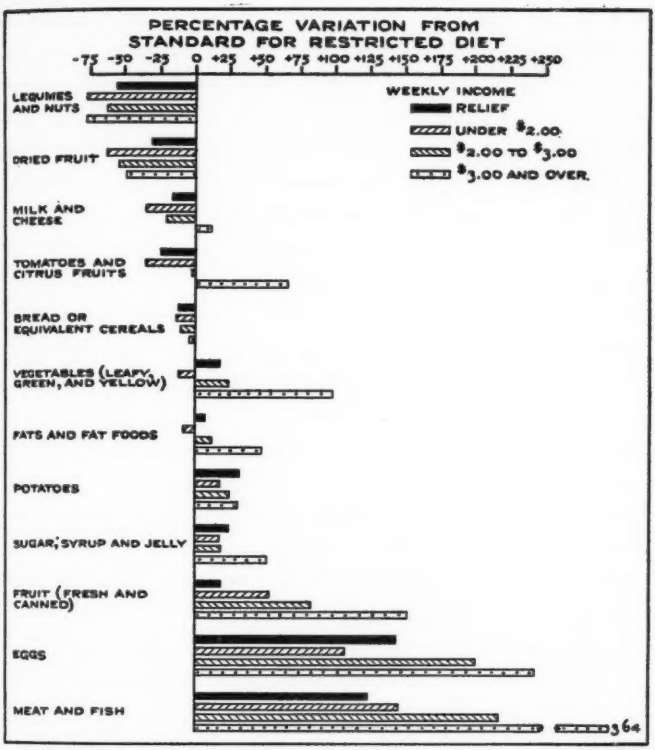

Fig. 2. Per cent more or less of each kind of food than the quantity recommended for a restricted emergency diet in the average weekly food supply of families of different weekly incomes per capita, in five large cities, April–May, 1933.

Families in the lowest income class showed the same type of poor selection of diet but had deficient amounts of more different foods than the other low-income groups. They had too little of the leafy, green, and yellow vegetables and were more deficient than the other groups in tomatoes and citrus fruits and milk, and also in dried legumes and dried fruits. Thus, their diet was not only inadequate in quantity but

was poorly balanced, too much emphasis being placed on meats, eggs, potatoes, and sweets and too little attention paid to "protective" foods. Not only is the calcium content of this diet approximately 25 per cent less and the phosphorus content about 15 per cent less than in the restricted standard dietary, but also there is a strong likelihood that vitamins A, C, and D are below the standard for safety.[9]

One of the striking indications of these low-income dietaries is that families with too little money to buy enough of their habitual foods do not reshape their diet and use cheaper substitutes but purchase less of the foods customarily used. They have not learned that a diet built around cereals and milk is cheaper and more nutritious than one built on meat and potatoes. Much popular education concerning the importance of the protective foods and on planning minimum cost adequate diets has been carried on but experience in this and other fields seems to indicate that it might be set down as almost axiomatic that those most in need of the information are hardest to reach.

Low-Income Families (1933) in Relation to Previous Income (1929). The relation of the predepression economic status of the family to the choice of foods by families with less than $3 per person per week or on relief is shown in Table 7. Although families which had been in moderately comfortable circumstances in 1929 (annual income of $425 or more per capita), on the average, had enough food to furnish adequate energy, their dietary was not well balanced due to an unwise selection of foods. The milk supply was 20 per cent less than the restricted standard and this, together with amounts of fruits and vegetables only slightly above the standard, makes the calcium content at least 10 per cent less than is provided by the restricted dietary. Meat and fish, eggs, potatoes, fats,

[9]The data were incomplete with respect to the use of whole grain cereals and it is not possible to estimate the sufficiency of the supply of vitamin B.

Kind of Food	Restricted[1] Standard	Pounds per Week per A.M.U. for Families Whose 1929 per Capita Income Was			Per Cent Above or Below Restricted Standard		
		Under $150	$150-$424	$425 or More	Under $150	$150-$424	$425 or More
Milk and equivalent cheese—qts.	*	2.92	3.05	3.00	−29	−22	−20
Meat and fish	.56	.92	1.34	1.80	+64	+139	+221
Eggs	.30	.62	.73	.84	+107	+143	+180
Potatoes	3.32	3.83	4.23	4.61	+15	+27	+39
Tomatoes, citrus fruit	1.21	.69	.92	1.05	−43	−24	−13
Vegetables, fresh–canned	1.18	1.25	1.59	1.82	+6	+35	+54
Leafy, green, yellow	1.02	.92	1.11	1.34	−10	+9	+31
Fruit, fresh—canned	.75	.80	1.06	1.26	+7	+41	+68
Legumes, dried—canned, nuts	.54	.19	.18	.22	−65	−67	−59
Dried fruits	.22	.13	.11	.15	−41	−50	−32
Fats, fat foods	.85	.77	.88	1.01	−9	+4	+19
Sugar, syrup, jelly	1.03	1.13	1.33	1.20	+10	+29	+17
Bread, and equivalent cereals	6.67	5.48	5.71	6.45	−18	−14	−3

[1]See footnote 6.

*Standard for milk is: Under $150—4.09 qts.; $150-$424—3.90 qts.; $425 or more—3.60 qts.

Table 7. Relation of the economic status in 1929 to the average supply of various foods for families on relief or with less than $3 per week per capita in five cities in April-May, 1933.

and sugars were purchased in larger quantities than is recommended for an adequate diet at minimum cost.

The dietary of the "chronic poor" was very deficient in foods essential for provision of minerals and vitamins; tomatoes and citrus fruits, milk, bread and cereals, and legumes were much less than marginal requirements, and leafy, green, and yellow vegetables, and fats were about 10 per cent below the restricted standard. Meat and eggs, though used in smaller quantity than by families in any other income class,

exceeded the amount recommended for a restricted emergency diet. In spite of at least several years' experience with poverty, these families did not make the best possible use of their money.

USE OF SPECIFIC FOODS BY INDIVIDUAL FAMILIES

While the average supply of foods gives a good indication of the type of diet favored by the families in the various income classes, individual families differ widely in the prominence of specific foods in their diet and it is of interest to consider some of these differences. In Table 8 is shown the percentage of families in a given income class which reported a specific amount of each food or group of foods. For each food, the amounts used are divided into three broad classes, the lowest class being less than the amount which was recommended for the restricted emergency diet and the highest class being more than the adequate standard when this was definitely higher than the emergency standard.[10] Only some of the more significant indications in Table 8 can be referred to in the following comments.

Meat and Fish. Although the average amount of meat and fish for all income classes was much higher than the restricted standard, nearly one-fourth of the families with less than $2 and 15 per cent of the relief families had less than this standard. The desire of practically all families for more meat than is allowed in the minimum cost adequate diet is demonstrated by the fact that 86 per cent of families with $3 or more purchased more than 1.25 pounds per week per adult male unit, and 63 per cent of the families with less than $3 in 1933 but formerly in the "comfortable" class continued to buy an excess of meat.

[10]The standard requirements for many foods, especially those not primarily energy foods, would vary for individual families according to the age and sex composition. The class intervals are taken, therefore, in round numbers and not the exact figures shown as the weighted average standard for groups of families.

Table 8. Distribution of families according to amount of various foods used, for families classified by income for week of food record and by change in income since 1929.

Kind of Food and Amount per Week per A.M.U.[1]	Weekly Income per Capita in 1933				Relief or Under $3.00 in 1933 with 1929 Income per Capita of		
	Relief	Under $2.00	$2.00–$2.99	$3.00 or More	Under $150	$150–$424	$425 or More
Meat and Fish	100.0	100.1	100.0	100.0	100.0	100.0	100.1
Less than .50 lbs.	15.3	23.4	8.3	4.5	23.0	15.7	11.4
.50–1.24	41.8	31.2	30.0	9.0	54.1	36.1	25.3
1.25 or more	42.9	45.5	61.7	86.5	22.9	48.2	63.4
Eggs	100.0	100.1	100.0	100.0	100.0	100.0	100.0
Less than .30 lbs.	10.2	16.9	3.3	1.9	14.8	10.9	7.6
.30–.59	32.4	39.0	26.7	15.2	42.6	31.5	26.6
.60 or more	57.4	44.2	70.0	82.9	42.6	57.6	65.8
Potatoes	100.0	100.1	100.0	100.0	100.0	100.0	100.0
Less than 3.00 lbs.	26.0	39.0	28.3	31.2	29.5	30.1	25.3
3.00–4.49	29.4	33.8	31.7	31.2	44.3	28.9	25.3
4.50 or more	44.6	27.3	40.0	37.6	26.2	41.0	49.4
Tomatoes and Citrus Fruit	100.0	100.0	100.0	99.9	100.0	100.0	100.0
None	13.6	26.3	18.6	7.1	21.3	15.3	19.0
Less than 1.00 lbs.	50.6	38.2	25.4	16.2	52.5	44.8	34.2
1.00–1.99	26.1	25.0	40.7	31.8	21.3	28.2	32.9
2.00 or more	9.7	10.5	15.3	44.8	4.9	11.7	13.9
Leafy, Green, Yellow Vegetables	100.0	100.0	99.9	99.9	100.0	100.1	99.9
None	18.6	16.9	12.7	4.8	16.1	16.5	19.4
Less than 1.00 lbs.	30.5	52.1	30.9	24.1	48.2	38.0	23.6
1.00–1.99	31.7	21.1	34.5	27.6	23.2	30.4	31.9
2.00 or more	19.2	9.9	21.8	43.4	12.5	15.2	25.0
Fruits, excl. Citrus, fresh-canned	99.9	100.0	100.0	100.0	100.1	100.0	100.0
None	40.1	40.3	28.1	13.8	37.7	39.8	31.6
Less than .75 lbs.	16.4	13.9	15.8	4.6	19.7	17.4	7.8
.75–1.49	19.7	22.2	17.5	27.0	29.6	15.5	22.4
1.50 or more	23.7	23.6	38.6	54.6	13.1	27.3	38.2
Dried Legumes, Nuts	100.0	100.0	100.0	99.9	100.0	100.0	100.0
None	64.4	80.5	66.7	78.8	73.8	69.3	65.8
Less than .40	14.7	10.4	18.3	11.5	9.8	16.3	12.7
.40 or more	20.9	9.1	15.0	9.6	16.4	14.4	21.5
Dried Fruits	100.0	100.0	99.9	100.0	100.0	100.0	100.1
None	58.2	75.0	73.3	71.3	54.1	69.7	64.6
Less than .20	9.6	6.6	5.0	4.5	13.1	6.7	5.1
.20 or more	32.2	18.4	21.6	24.2	32.8	23.6	30.4
Fats and Fat Foods	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than .80 lbs.	47.5	55.3	42.4	19.1	55.7	49.7	39.7
.80–1.19	28.2	25.0	35.6	39.5	27.9	27.3	30.8
1.20 or more	24.3	19.7	22.0	41.4	16.4	23.0	29.5
Sugar, Syrup, Jelly, Et Cetera	100.0	100.1	100.0	100.0	100.0	100.0	100.1
Less than .80 lbs.	18.1	23.9	22.0	14.2	25.0	14.4	26.9
.80–1.19	32.2	26.9	34.0	23.4	35.0	30.7	29.9
1.20 or more	49.7	49.3	44.0	62.4	40.0	54.9	43.3
Bread and equiv. Cereals	100.0	100.0	100.0	100.0	100.1	100.1	100.0
Less than 5.00 lbs.	35.7	34.7	41.4	25.8	36.7	38.3	29.3
5.00–6.99	36.8	36.0	27.6	40.0	41.7	34.0	32.0
7.00 or more	27.5	29.3	31.0	34.2	21.7	27.8	38.7
Number of Families[2]	177	77	60	158	61	166	79

[1]The class limits are set so that the upper limit of the lowest class is slightly less than the amount in the restricted standard and the lower limit of the highest class is slightly more than the adequate standard, when that is higher than the restricted.

[2]The number changes slightly for some items, because a family was omitted in this tabulation if the quantity of a specific food included in the food group was not definite.

Eggs. The popularity of eggs with the majority of families is indicated by the large proportion of families which used more than the adequate standard and the very small percentage of families which used less than the restricted standard. Because of the richness of eggs in vitamins A, B, D, and G in addition to their iron and protein content, they make important nutritional contributions to these low-income diets, but should not replace milk for children.

Potatoes. The use of potatoes varied less according to income than most foods. From 25 to 31 per cent of the families in the various income classes except the lowest (under $2) used less than three pounds per adult male unit per week and 39 per cent of the lowest income families had less than three pounds. Except for the lowest income class and the "chronic poor," about 40 per cent of the families had 4.5 pounds or more.

Tomatoes and Citrus Fruits. The marked differences in the use of tomatoes and citrus fruit according to income are significant. Of the families with $3 or more per person per week, about 45 per cent had a weekly supply of over two pounds per adult male unit and only 7 per cent reported none, but of families with less than $2 and of the relief families only 10 per cent had two pounds or more and 26 and 14 per cent of these groups respectively reported none. The percentage of the "new poor" using none was about the same as of the "chronic poor" (19 and 21 per cent), but more of the "new poor" had an adequate amount. These foods which are so important as a source of vitamin C were used liberally by most families when funds were not limited, but their importance in a restricted diet did not seem to be understood.

Leafy, Green, Yellow Vegetables. From 13 to 19 per cent of the low-income and relief families had none of this group of vegetables. Fifty per cent of the relief group had at least

marginal requirements but only 30 per cent of the families with less than $2 met this standard. Among the poor families which had been "comfortable" in 1929, 19 per cent had none of these vegetables, as high as for any income class, but 57 per cent of the families had at least one pound per adult male per week.

Fruits, Except Citrus. Fruits were used liberally by more than half of the families in the high-income class, but 40 per cent of those in the lowest income class and on relief had none. In the use of fruits, there seems to be a tendency for the family either to have none or to use them in excess of the amounts recommended for an adequate low-cost diet, and this was especially true of the families which had become poor since 1929.

Dried Legumes and Nuts. The cheapness of dried beans and peas and of nuts in relation to their value as sources of protein and mineral substances and also of energy value did not seem to be appreciated by these families. From 65 to 85 per cent of the families reported none at all, but about 15 per cent of these purchased canned pork and beans. The season in which the records were obtained may have influenced the use of legumes, since families which used them during the winter months may have sought a change by the use of fresh vegetables, some of which were becoming available at moderate prices early in May.

Dried Fruits. Nearly three-fourths of all families not on relief had no dried fruits, and 58 per cent of the relief families had none. About one-third of all relief families, of the "chronic poor," and of the "new poor," had .20 pounds or more per adult male unit.

Fats. The use of fat foods varied according to income more than other staple articles of diet such as sugar, bread, and potatoes. Of the families with $3 or more, only 19 per cent

used less than .80 pounds per week per adult male unit, but 55 per cent of those with less than $2 and 48 per cent of the relief families had less than .80 pounds.

Sugary Foods. The excessive use of sugar and other sweets is rather striking, about 50 per cent of the poorest families had a supply of more than 1.20 pounds per adult male unit, although the average standard for an adequate amount was approximately one pound.

Bread and Cereals. It is surprising to find one-third of these low-income families using less than five pounds of bread and equivalent cereals, and to find a smaller proportion of families of low-income than of relatively high-income families which are liberally supplied. In a balanced diet at minimum cost, cereal foods should have a larger place than in the food budget of moderate cost, but no tendency to follow this policy is indicated by these data. A larger percentage (39) of the families of low-income which had been "comfortable" in 1929 than of any other income class had an ample supply.

Table 9. Percentage distribution of families according to quarts of milk purchased per week per person under 17 years of age, for families of various incomes in 1933 and according to 1929 income, in five cities.

Quarts per Week per Child under 17 Years of Age	Weekly Income per Capita in 1933				Relief or Under $3.00 in 1933 with Annual per Capita Income in 1929 of		
	Relief	Under $2.00	$2.00-$2.99	$3.00 or More	Under $150	$150-$424	$425 or More
Any number	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than 3	24.7	46.7	26.3	12.1	47.5	28.6	21.1
3.0–5.9	53.0	33.3	49.1	32.6	32.8	54.0	46.5
6.0–8.9	16.3	16.0	15.8	28.4	14.8	13.7	21.1
9.0 or more	6.0	4.0	8.8	26.9	4.9	3.7	11.3
Number of Families	166	75	57	141	61	161	71

Milk. The distribution of families according to the supply of fresh and canned milk per child under 17 years of age is shown in Table 9. As most of the milk was consumed by the children and nutritionally it is of special importance to them, the amount per child is more significant than the amount per adult male unit. Only 12 per cent of families with $3 or more per week had less than three quarts of milk per child, but 47 per cent of families with less than $2 had this limited supply. Among the relief families, 25 per cent had less than three quarts per child. From 20 to 25 per cent of the families in the lower income classes had six quarts or more per child per week, but 32 per cent of the "new poor" had at least six quarts.

SICKNESS AND FOOD SUPPLY

No attempt has been made to correlate the family dietary with the sickness records obtained for the three months immediately preceding the health survey of which these data on food supply were a part. If these 472 families are subdivided according to the adequacy of food supply and income, the number of persons in a specific class obviously is too small to give a stable or reliable sickness rate during a three-months' period. When the food records were collected, it was expected only that they would give an indication of whether nutritional deficiencies might be a factor contributing to ill health in these cities. Although housing and other factors in the standard of living also are adversely affected by low income, the very marked association between income and the adequacy of the diet and the well-known inverse correlation between income and the incidence of illness give good reason to believe that there is some association between sickness and diet.

The incidence of sickness in these five cities and in other

cities in the survey has been published, not for individual cities but for groups of cities.[11] Sickness showed a consistent correlation with the economic status of the families, the lower the income the higher the sickness rate, and also a striking association with unemployment, families with no employed workers having about 50 per cent more cases of disabling illness than those with a full-time worker. These results are consistent with the differences found in the food supply which, for families with less than $3 per week per person, was, in general, about marginal or less than marginal in quantity with a marked tendency to be poorly balanced and to have less than "safe" requirements of milk and other protective foods. Sickness rates were highest in families with less than $150 per person in the year 1932.

For families which had suffered marked loss of income between 1929 and 1932, however, the sickness rate and the food supply do not show similar differences when compared with the "chronic poor." The "new poor" had a much higher sickness rate but they had, on the average, a more nearly adequate food supply than the "chronic poor." While this lack of correlation cannot be explained fully, certain indications in the data suggest possible factors involved in the high sickness rate. For example, it is evident that reduced income brought about marked changes in the usual dietary and that the foods necessary to maintain good nutritional balance were reduced, on the average, below the level of accepted requirements and in some cases below the safe marginal level. Thus, the amounts of milk and tomatoes and citrus fruits were below the quantities recommended for

[11]Rates for Birmingham, Detroit, and Pittsburgh were published in Sickness and the Depression, Perrott, G. St. J., and Collins, Selwyn D.: Milbank Memorial Fund *Quarterly*, October, 1933, pp. 281–298; rates for Baltimore, Cleveland, and Syracuse in Sickness and the Depression by the same authors in the *Quarterly*, January, 1934, pp. 28–34.

emergency restricted diets and vegetables were not used in fully adequate amounts; all of these foods were used in much smaller amounts than these families were accustomed to, if we may assume that their diet previously had been similar to that of their neighbors who were not so poor. Furthermore, the individual family did not have the average diet and Table 8 shows that in the case of many foods the per cent of the "new poor" inadequately supplied was as high as the per cent of the "chronic poor." For example, 19 and 21 per cent of the "new poor" and "chronic poor" respectively had no tomatoes or citrus fruits, 19 and 16 per cent had no leafy, green, or yellow vegetables, 65 and 54 per cent had no dried fruits, and 32 and 38 per cent had no fresh and canned fruits; and 25 and 29 per cent had less than three pounds of potatoes per adult male unit. Families unaccustomed to such deprivations of food may have contributed heavily to the high sickness rates among the "new poor."

Specific food deficiency diseases were not found among the illnesses reported by the families surveyed in these cities. The relationship between the diet and sickness, if it is accepted that there was some association, would seem to be more a matter of lowered vitality and reduced resistance to disease.

PUBLIC HEALTH IN RURAL RECONSTRUCTION AT TING HSIEN[1]

FOURTH ANNUAL REPORT OF THE RURAL PUBLIC HEALTH EXPERIMENT IN CHINA

by C. C. CH'EN, M.D., M.P.H.[2]

A SURVEY of medical and health conditions prevailing in Ting Hsien was made in 1930, by the Department of Social Survey in collaboration with the Department of Public Health, to serve as a basis for the inauguration of a health experiment. According to the data secured, nearly 30 per cent of the people who die in Ting Hsien receive no medical attention whatsoever. Of the 472 villages in the district, 220 possess no medical facilities of any kind, and the other 252 can boast of little more than a self-made (and not infrequently illiterate) physician of the old type who prescribes drugs which he himself sells. Yet it revealed that the annual per capita expenditure of the people in the district for medicines and medical attention of such an unreliable type is about 30 cents.

The most pressing problem in connection with health in rural China today would seem to be the evolution of a system, practicable under existing conditions, to make elementary medical relief and health protection available for the masses. The system now being developed in Ting Hsien is built according to the resources of the three rural administrative units, the village, the sub-district, and the district

[1]This excerpt has been taken largely from a pamphlet issued by the Chinese National Association of the Mass Education Movement under the title, The Ting Hsien Experiment in 1934, and is based on Dr. Ch'en's report for the year 1933.

[2]Head, Department of Public Health, Chinese National Association of the Mass Education Movement. This Department of Public Health has received financial and technical assistance from the Milbank Memorial Fund since 1929.

(hsien), and provides for three classes of service, the village health worker, the sub-district health station, and the District Health Center.

Village Health Worker. The average village, with a population of about 700 and not more than $150 available for medical purposes, could not possibly support any known type of regular medical personnel; and yet under present conditions in the rural districts, the foundation of a community health system must be the village.

The village health worker is a member of the People's School Alumni Association of his village. He has been recommended by the village elder for the position, and has completed a ten-day course of health training at a sub-district health station. He is expected to perform the following duties:

1. Record the births and deaths in his village.
2. Vaccinate his village against smallpox.
3. Reconstruct his own well, as a demonstration, according to an approved design to reduce the danger of surface pollution.
4. Give simple treatments according to the facilities of his "first aid box," which contains ten essential and safe drugs.
5. "Introduce" to the sub-district health station patients whose ailments do not come within his scope.
6. Serve as a "health extension agent," giving every possible assistance to the higher grades of health personnel in making contacts with the people and transmitting ideas.

Thus in the village is provided the foundation for vital statistics, epidemic control, sanitation, and medical relief.

The village health workers give an average of five treatments a day, at a cost of 1.1 cents per treatment, including material and labor. Over 95 per cent of these treatments are found to be correct.

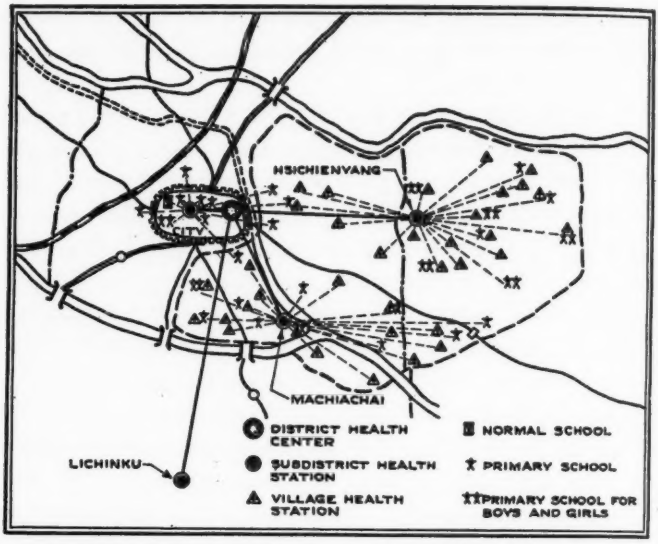

Fig. 1. Map of the research community in Ting Hsien, China, showing the organization of the health service and the distribution of school health work in December, 1933.

While the village health worker's training course is exceedingly brief, he receives regular supervision (at least once a week) from the physician at the sub-district health station, which is considered to be the most valuable part of his training. Other factors which make for the effectiveness of the village health workers are these: They realize, and their neighbors also know, the limitations of their training; their membership in an organized group, the Alumni Association, subjects them to group opinion and censure; and they could easily be replaced if they should prove incompetent or should attempt too much. In June, 1934, there were sixty-one health workers in fifty-eight villages in Ting Hsien.

Sub-District Health Station. To supplement the work of the village health workers with a higher type of service, a

qualified physician ("B-Grade") and dresser or nurse are located in the sub-district health station. Under the health system it is possible for the health stations to serve a population of approximately 30,000 each, carrying on both curative and preventive work. To prepare these workers, special supplementary training is given to the station staff at the District Health Center. Graduates of "B-Grade" medical schools are the type of medical personnel ordinarily available today, and this will probably be true for many years to come. Furthermore, the graduates of the highest type of school are beyond the economic reach of rural communities. It may be of interest to mention in this connection that in Ting Hsien there are no less than sixteen graduates of "B-Grade" schools, but only three of them are even attempting to practise. Two reasons may be offered in explanation: the training they have received does not equip them for service in the rural districts; and isolated as they are, they are not able to obtain the confidence of the people, and cannot make a living out of such meager practice as they might secure.

A daily clinic is conducted at the health station. In 1933, the average daily attendance at each clinic was 29. Of the new patients, over 3 per cent were referred by the village health workers. The average cost of treatment was about 9 cents.

Other duties and activities of the health station staff are: supervision of village health workers, local "midwives" (old type retrained) and midwifery helpers; school health work; popular health education; and vaccination against smallpox. There is a weekly conference for the physicians at the District Health Center.

There are at present four health stations, two in the villages maintained by the Movement for experimental purposes, and one city and one village station each under the

auspices of the local government. With the supervision and help of the District Health Center, the physicians in these stations are able to do a great deal of work that could not be expected of isolated physicians.

District Health Center. A Health Center, housing a hospital with fifty beds and a laboratory, as well as administrative offices and classrooms, serves the entire hsien. It coordinates and supplements all the activities of the sub-district health stations so that they will be free from administrative conflicts and maintain a requisite professional standard. The Health Center also takes up such activities as control of epidemics, and special studies in connection with school health, sanitation, maternity and child health, birth control, training of physicians, nurses, dressers, et cetera, as well as giving intensive training courses to medical students and other personnel.

Vital Statistics. The statistical work in 1933 was carried on by a system of supervised registration, using the police in the city and sixteen village health workers in sixteen villages. The method is fairly accurate, and is inexpensive. A birth or death certificate at present costs 13 cents, which eventually, as the system expands, should be reduced to 3 cents. The birth rate per 1,000 population in the research community in 1933 was 40.1. The general death rate per 1,000 was 27.2, with an infant mortality rate of 199.0 and a maternal mortality rate (per 1,000 live births) of 13.0.

Hospitalization. Only patients referred from the sub-district health stations are accepted at the hospital in the District Health Center. In 1933, there were 418 patients admitted, 67.7 per cent male and 32.4 per cent female. The average length of stay was fifteen days, and the average cost per patient per day about $1.79, of which the patient pays 40 cents.

It is apparent from analysis of the pathological conditions among the patients that in the medical center of a large district, treatment of medical and surgical conditions are of equal importance. The reasonable conclusion would seem to be that special attention will have to be given in the medical schools to training physicians for good, all-round service rather than specialized service, for many years to come.

School Health.[3] An experiment conducted in twenty-five village primary schools within a radius of six miles from the sub-district health stations included physical examinations by the physicians. It was shown that 58.5 per cent of the children had trachoma and 26.2 per cent ring-worm of scalp. Treatment was given by the teachers and nurses. The program included also attention to personal and environmental cleanliness, and special efforts are being made to have the schools reconstruct their drinking wells and latrines. Health instruction was given in the early stages by the nurses and later by the teachers themselves.

Maternity and Child Health. This problem has two aspects, reduction of birth rate on the one hand, and reduction of maternity and infant mortality (which is more than twice that found in most Western countries) on the other.

Propaganda among the Alumni Associations through Social Type Education, and a birth control consultation room at the Health Center, resulted, in less than two months' time, in young men coming from over ten villages for advice.

In 1933, twenty-seven "old midwives," trained and under monthly supervision, delivered 428 babies with 8 infant deaths and no maternal deaths. An experiment is being con-

[3]The school health activities in Ting Hsien were discussed at some length in an article by Dr. C. C. Ch'en in the last issue of the *Quarterly*. See: Ch'en, C. C., M.D., M.P.H.: An Experiment in Health Education in Chinese Country Schools. The Milbank Memorial Fund *Quarterly*, July, 1934, xii, No. 2, pp. 232–247.

ducted in training young "midwifery helpers" gradually to supplant the old type of midwives. It is economically impossible to bring in well-trained midwives to the rural districts, as the cost per delivery would then be about $7. The midwifery helpers are paid 20 cents per delivery, and with supervision from the sub-district health stations, it is felt that this type of service may render possible a solution of the problem of obstetrical care in the rural districts.

SUMMARY

It is impossible in this brief space to cover every activity of the Department. The foregoing sections are merely intended to show the general developments in the Department and, in order to help visualize the work of the Department as a whole, a summary, contrasting the work in 1933 with that in 1932, is presented below:

1932	*1933*
Vital Statistics	
1. A registration system was being evolved, with no important conclusions.	1. The system functioned satisfactorily throughout the year, giving definite and instructive results.
2. Cost of the work as done by the system was unknown.	2. Cost is found to be lower than any other known system.
Popular Health Education	
1. Health education material for adults limited to texts used in People's Schools.	1. Three different sets of experimental posters for the use of three types of teachers are available.
2. No direct means of developing community health	2. Chinese New Year Exhibit, Temple Fair Wheelbarrow,

consciousness had been devised.	Cleanliness Campaign were all demonstrated to be satisfactory.
3. 40,000 posters and pamphlets were distributed.	3. Over 70,000 pieces of printed material were distributed.
Sanitation and Control of Communicable Diseases	
1. A sanitary survey was made by competent engineers.	1. Considerable number of drinking wells and latrines were reconstructed according to proposed designs.
2. About 6,000 vaccinations against smallpox were made.	2. Over 15,000 vaccinations were performed with about 3,500 primary "takes."
School Health	
1. About 40,000 treatments were given to about 1,200 students.	1. About 53,000 treatments were given to 2,700 students resulting in marked reduction of physical defects.
2. Classroom instruction was limited to the children in the town.	2. Regular health training was extended to the remote villages of the research community.
Medical Relief	
1. Full-time first aid service was available in 15 villages.	1. The service was extended to 34 villages.
2. About 4,000 first aid treatments were given.	2. 22,418 treatments were given.
3. 20,000 treatments by physicians were given at the sub-district stations.	3. Over 25,000 treatments were given, not including those given in dental and maternal clinics.
4. Two wards in the hospital	4. Three wards were open with

were used with 2,771 patient-days of care and 62 operations.	6,162 patient-days of care and 150 operations.
5. 2,410 specimens from the hospital were examined in the laboratory.	5. Over 5,500 specimens were examined, over 10 per cent of them from the sub-district health stations.
Maternity and Child Health	
1. 27 "old midwives" were trained and supervised.	1. In addition, 4 younger midwifery helpers, the successors of old midwives, were given one-month course.
	2. Birth control propaganda reached about 50 villages and men from 10 villages have come for advice.

It is clear that the activities of the Department have expanded both in quantity and quality during the last year, in spite of political and economic unrest. It is especially noteworthy that the expansion was not due to the sole efforts of the Department as an isolated unit, but rather to cooperation and coordination with other phases of the work of the Movement, with the local government, and with other organizations both within and without the district. The entire health system, including the Health Center, health stations, and health workers, is well within the economic reach of the people. The people's acceptance of it, however, depends on the effectiveness not of the health program alone, but of the all-round reconstruction program, raising the general intellectual and economic level of the people.

PAMPHLETS FOR DISTRIBUTION

AS a part of its service in the field of health education, the Milbank Memorial Fund from time to time secures reprints of papers by its staff members and associates, published in its own or outside periodicals, for distribution to interested readers. Following is a partial list of the reprints available for distribution, copies of which may be had upon request. Unless otherwise specified, there is no charge for these pamphlets.

ACCURACY OF OFFICIAL TUBERCULOSIS DEATH RATES, THE. Jean Downes. *Journal of the American Statistical Association*, December, 1931.

ACCURACY OF THE RECORDED BIRTH STATISTICS IN URBAN AND RURAL AREAS, THE. Jean Downes. *Journal of the American Statistical Association*, March, 1929.

AGE INCIDENCE OF COMMUNICABLE DISEASES IN A RURAL POPULATION. Edgar Sydenstricker and Selwyn D. Collins. United States Public Health *Reports*, January 16, 1931. Reprint No. 1443.

CAMPAIGN CALENDAR OF A PUBLIC HEALTH ORGANIZATION, THE. Savel Zimand. The Milbank Memorial Fund *Quarterly Bulletin*, October, 1931.

CATTARAUGUS COUNTY AND OUR RURAL HEALTH. John A. Kingsbury. *American Review of Reviews*, April, 1927.

CERVICO-VAGINITIS OF GONOCOCCAL ORIGIN IN CHILDREN. Walter M. Brunet, Dora M. Tolle, Sara Alicia Scudder, and Anne R. Medcalf. *Hospital Social Service Magazine*, March, 1933. Supplement No. 1.

CHANGES SINCE 1900 IN THE FERTILITY OF NATIVE WHITE WIVES. Walter F. Willcox. The Milbank Memorial Fund *Quarterly Bulletin*, July, 1932.

CONTRACEPTION AND FERTILITY IN 2,000 WOMEN. Raymond Pearl. *Human Biology*, September, 1932.

CORRECTION OF INFANT MORTALITY RATES FOR RESIDENCE, THE. Dorothy G. Wiehl. *American Journal of Public Health*, May, 1929.

DEATHS OF NONRESIDENTS IN SYRACUSE. Elliott H. Pennell. The Milbank Memorial Fund *Quarterly Bulletin*, July, 1932.

DECLINE IN THE TUBERCULOSIS DEATH RATE IN CATTARAUGUS COUNTY, THE. Edgar Sydenstricker. The Milbank Memorial Fund *Quarterly Bulletin*, April, 1928.

ECONOMICS OF PUBLIC HEALTH AND MEDICAL CARE, THE. Ray Lyman Wilbur, M.D. The Milbank Memorial Fund *Quarterly Bulletin*, July, 1932.

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EPIDEMIOLOGICAL STUDY OF A RURAL OUTBREAK OF WHOOPING COUGH, AN. Travis P. Burroughs, M.D. The Milbank Memorial Fund *Quarterly Bulletin*, January, 1932.

FACTORS INFLUENCING RATIOS OF CHILDREN TO NATIVE-WHITE WOMEN IN THE UNITED STATES, 1900 AND 1930. Frank Lorimer. The Milbank Memorial Fund *Quarterly Bulletin*, April, 1933.

FERTILITY OF SOCIAL CLASSES IN VARIOUS TYPES OF COMMUNITIES OF THE EAST NORTH CENTRAL STATES IN 1900. Clyde V. Kiser. *Journal of the American Statistical Association*, December, 1932.

FIRST YEAR OF THE RURAL HEALTH EXPERIMENT IN TING HSIEN, CHINA. Hsun-Yuan Yao, M.D. The Milbank Memorial Fund *Quarterly Bulletin*, July, 1931.

IMPROVED TECHNIQUE IN THE SURGICAL TREATMENT OF FACIAL PALSY. Arthur B. Duel, M.D. The Milbank Memorial Fund *Quarterly Bulletin*, January, 1933.

INTERPRETATION OF LABORATORY FINDINGS IN RURAL SPRING WATER SUPPLIES. Edmund K. Kline and Nelson M. Fuller. *American Journal of Public Health*, July, 1932.

MEASUREMENT OF PUBLIC HEALTH WORK, THE. Edgar Sydenstricker. The Milbank Memorial Fund Annual Report, 1926.

PHYSICAL IMPAIRMENTS AND OCCUPATIONAL CLASS. DIFFERENTIAL RATES BASED UPON MEDICAL EXAMINATIONS OF 100,000 NATIVE-BORN, ADULT, WHITE, INSURED MALES. Edgar Sydenstricker and Rollo H. Britten. United States Public Health *Reports*, August, 1930.

PHYSICAL IMPAIRMENTS OF ADULT LIFE: ASSOCIATION WITH SUBSEQUENT RATES OF MORTALITY. Rollo H. Britten. *Journal of Preventive Medicine*, July, 1932.

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